AUGUST 3, 1953

NEWS ISSUE

# Electrical World

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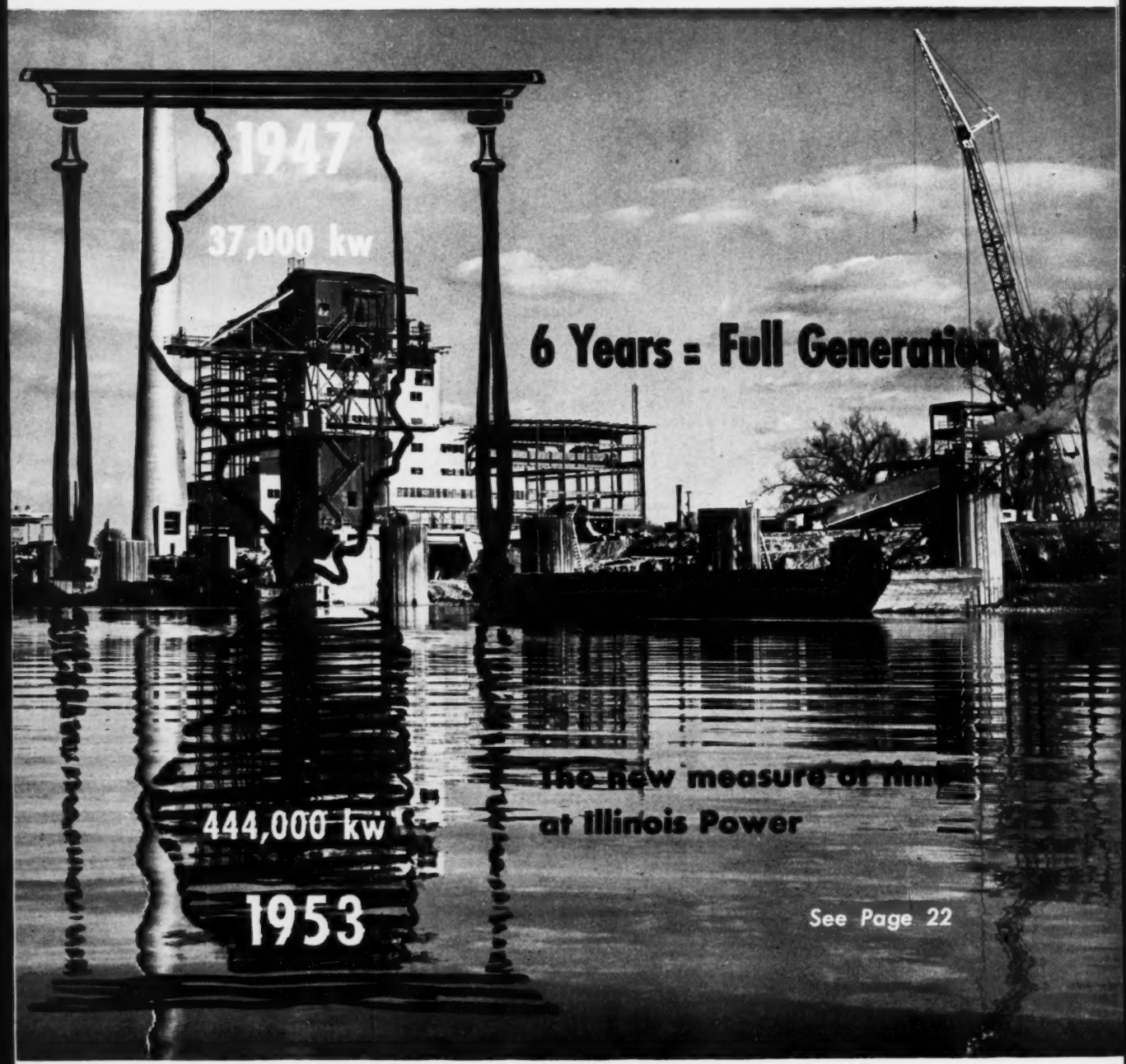


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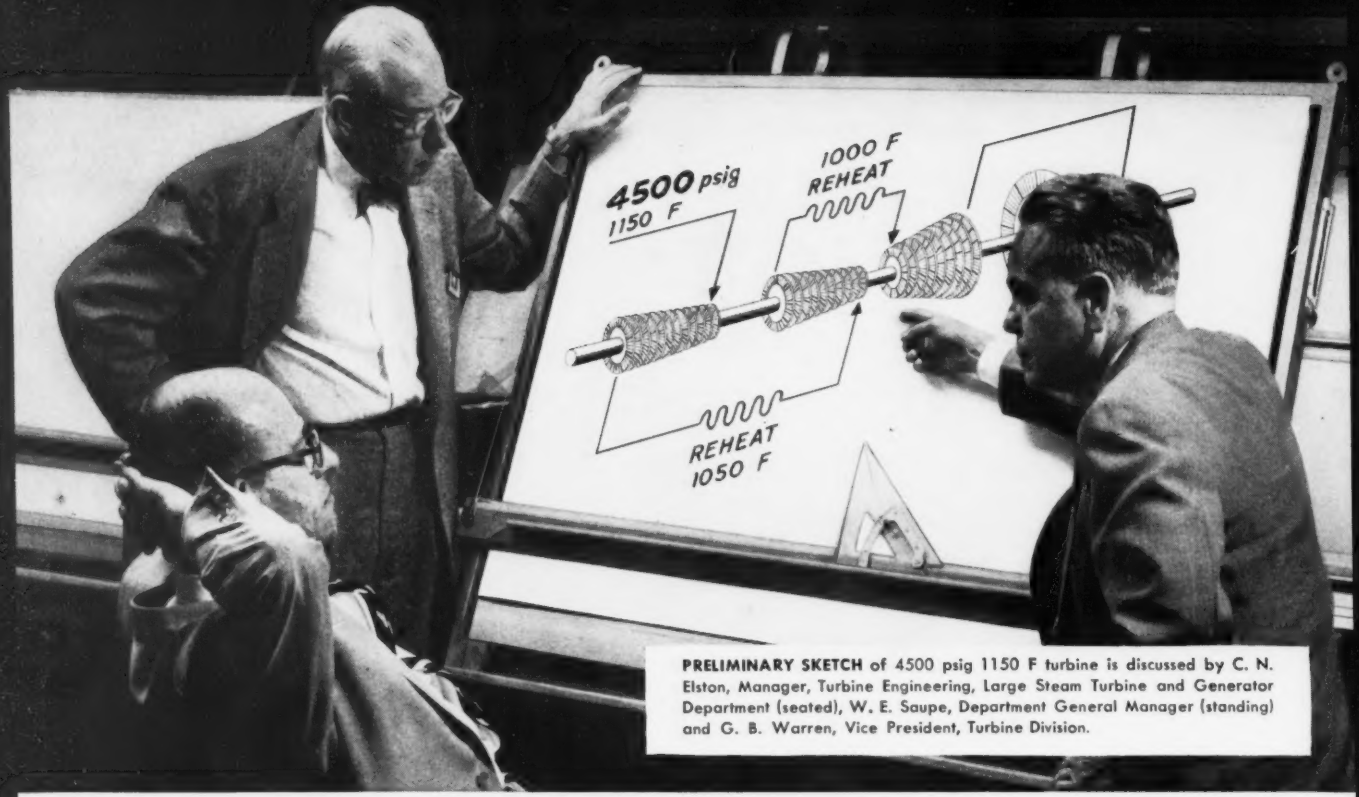
TV Is Boosting Power Sales . . . Page 50

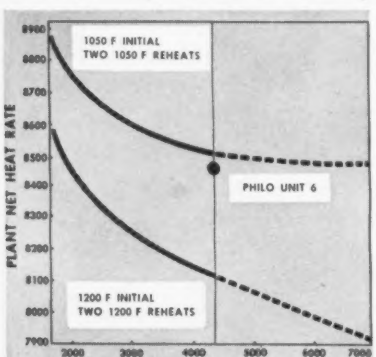



**PRELIMINARY SKETCH** of 4500 psig 1150 F turbine is discussed by C. N. Elston, Manager, Turbine Engineering, Large Steam Turbine and Generator Department (seated), W. E. Saupe, Department General Manager (standing) and G. B. Warren, Vice President, Turbine Division.

## 4500 psig double reheat turbine points way to

# NEW ADVANCES IN STATION ECONOMICS

A continuous program of co-operation and research between American Gas & Electric Service Corp., Babcock & Wilcox Co. and the General Electric Co. has led to the development of a new unit for the AG&E system. This single boiler—single turbine, unit system embodies many new and forward-reaching technological ideas that will contribute to an expected over-all plant thermal efficiency of more than 40%.




**IMPROVED STATION EFFICIENCY** is obtained through increasing temperature and pressure, as boldly done for Philo Unit No. 6. Studies indicate that for any further significant increases, considerably higher initial and reheat temperatures will be required to take advantage of pressures higher than 4500 psig.

The new G-E 4500-psig turbine will operate at almost double the present highest steam pressure utilized for power generation. Initial steam temperature of 1150 F (present highest 1100 F used in another G-E machine) will be followed by two stages of reheat, the first at 1050 F, the second at 1000 F. A newly developed high pressure turbine is used in tandem with a turbine of the reverse flow type developed by G-E engineers several years ago.

### NEW MATERIALS NEEDED

Because of these high temperatures some of the working parts such as inner shells, stop valves, control valves, steam leads, etc., must be constructed of special alloys. A feature of the control system of this unit will be an initial temperature regulator which will protect both the steam boiler and the turbine in a manner similar to an initial pressure regulator on a conventional boiler.

### POSSIBLE REDUCTIONS

The embodiment of these higher pressures, higher temperatures and new ideas of reheat in a moderately sized commercial unit and its installation and operation in the Philo Plant of the Ohio Power Company will provide experience in the design, manufacture, construction and operation of the newly developed equipment. This daring forward step should make possible new world standards of efficiency in the generation of electric power and it may open a new era for America's Electric Utility Industry. It may ultimately make possible capital investment reductions by compressing unit sizes and bringing about more effective utilization of materials. General Electric Co., Schenectady 5, New York.

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

301-238

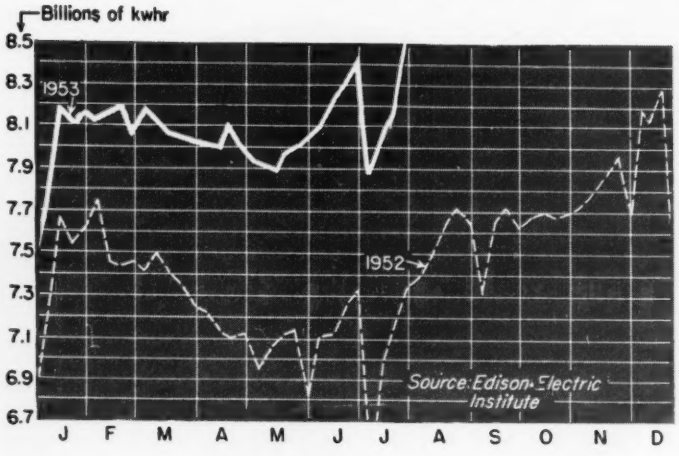
*MORE POWER TO AMERICA*

GENERAL ELECTRIC

VOLUME 140, NO. 5

August 3, 1953

# Electrical World




## Output Week Ended July 25—8,460,427,000 Kwhr

Per Cent Change From Previous Year

| | Total US | New Eng. | Mid. Atlan. | Cent. Ind. | West Cent. | South-east | South Cent. | Rocky Mount. | Pacific NW | Pacific SW |
|---|---|---|---|---|---|---|---|---|---|---|
| July 25 | +15.4 | +11.1 | +11.9 | +20.6 | +13.2 | +20.3 | +9.1 | +10.0 | +10.0 | +15.4 |
| July 18 | +14.3 | +9.4 | +9.6 | +19.2 | +13.4 | +19.7 | + 5.5 | +11.4 | +11.9 | +14.6 |
| July 11 | +15.9 | +4.4** | +15.1 | +19.8 | +13.8 | +20.3 | +13.1 | +15.0 | +15.3 | +13.6 |

## Electric Power Statistics

| | | Latest Month | Preceding Month | Year Ago |
|---|---|---|---|---|
| Peak Load (Million Kw) | May | 73.5 | 72.9 | 65.9 |
| Capacity (Million Kw) | May | 84.34 | 83.84 | 77.01 |
| Production (Billion Kwhr) | May | 35.98 | 35.63 | 31.82 |
| Hydro | | 10.29 | 9.70 | 9.69 |
| Fuel | | 25.69 | 25.92 | 22.13 |
| Fuel Consumption | | | | |
| Coal (Million Tons) | May | 8.59 | 8.91 | 8.01 |
| Oil (Million Barrels) | | 6.09 | 7.15 | 3.72 |
| Gas (Billion Cu Ft) | | 87.85 | 76.58 | 76.99 |
| Sales (Billion Kwhr) | May | 31.32 | 31.75 | 27.94 |
| Residential | | 8.50 | 8.86 | 7.52 |
| Commercial | | 5.18 | 5.15 | 4.74 |
| Industrial | | 15.49 | 15.46 | 13.83 |
| Other | | 2.16 | 2.28 | 1.86 |
| Net Income Class A & B Companies ($ Million) | May | 82.13 | 86.27 | 68.49 |
| Estimated Dec. '53 Peak (Million Kw) | Apr. | 86.5 | 86.5 | 88.6 |
| Kwhr per Residential Customer (12 Month Average) | Apr. | 2,224 | 2,209 | 2,066 |
| Revenue per Kwhr Residential Service (12 Month Average) | Apr. | 2.76¢ | 2.76¢ | 2.79¢ |
| Canadian Production (Billion Kwhr) | May | 5.76 | 5.75 | 5.33 |

## Business Statistics

| | | | | |
|---|---|---|---|---|
| FRB Industrial Production Index††† | May | 241 | 240 | 211 |
| Gross National Product Annual Rate ($ Billion) | 4thQtr. | 355.2 | 343.0 | 337.1 |
| EW 5 Industry Production Index | May | 129.6 | 130.2 | 116.0 |
| ENR Construction Cost Index†† | July | 126.6 | 124.4 | 119.6 |
| BLS Consumer's Price Index | June | 114.5 | 114.0 | 113.4 |
| NEMA Insulation Materials Sales Index† | May | 631 | 694 | 517 |
| NEMA Electric Appliance Sales Index† | | 299 | 317 | 219 |
| NEMA Household Refrig. Sales Index† | | 158 | 188 | 128 |

*Preliminary **Revised †1936=100 ††1949=100 †††Unadjusted

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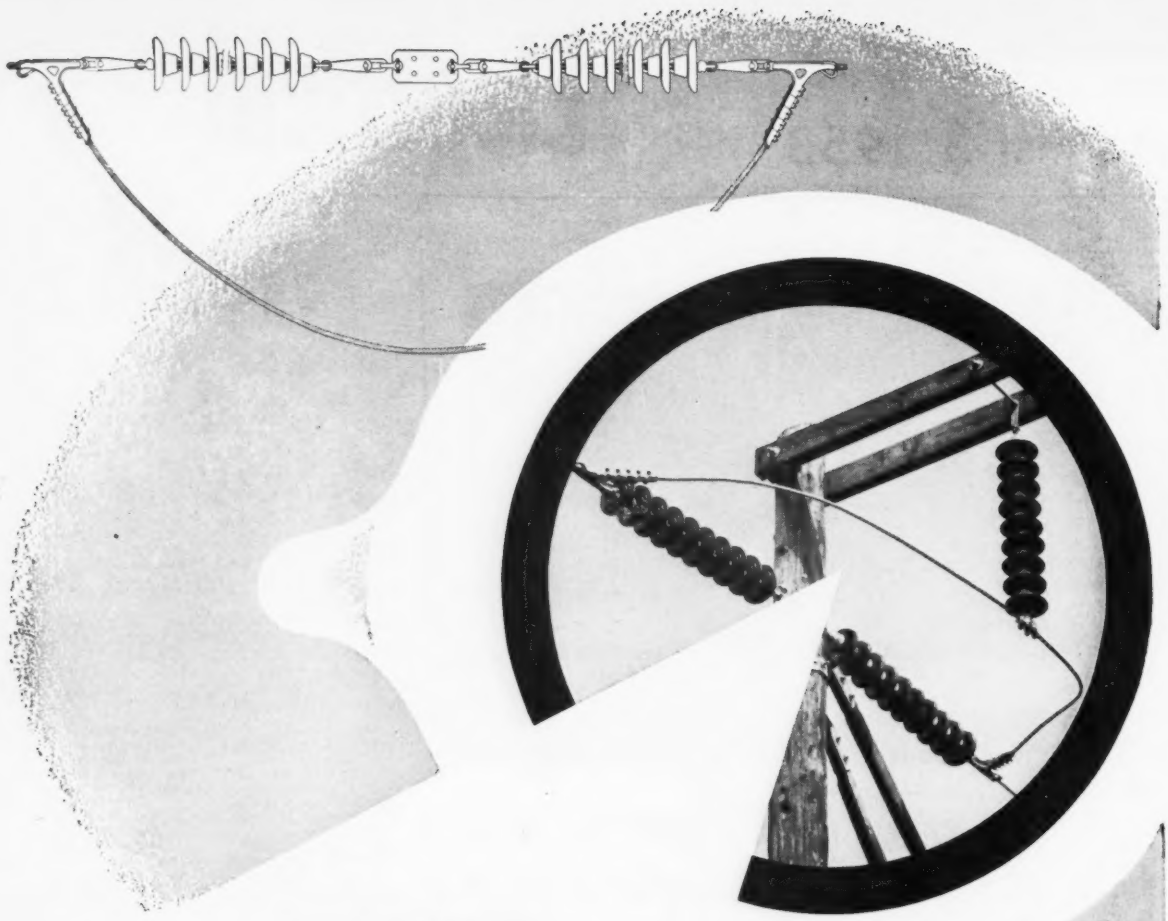

# THE POWER CAN'T "SEE" *THESE JUMPER LOOPS*

The only splices you must have on a transmission line are between reels. Spliced jumpers at strain points, and the troubles that go with them, are unnecessary.

Continuous-cable jumper loops are the natural consequence of using Hi-Lite strain clamps. Jumpers that the power can't "see" are just as easy to build - or easier - than those with splices.

As a bonus you get a clamp that is inherently low priced; that installs in a matter of minutes; that takes nothing more than a common hand wrench by way of installation equipment. The clamp can be physically checked any time in the life of the line for holding power.

Take a look at your deadend clamping practice and consider the advantages of mechanical simplicity and unspliced jumpers.

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# THE ELECTRICAL WEEK

**The Issue's News Highlights**—Congress clears appropriations bills providing funds for federal power program and directs Interior to make several policy changes.

Former Deputy Chief of Army Engineers, testifying for Idaho Power at FPC hearing, declares utility's three-dam plan is superior to high dam proposal . . . Eugene (Ore.) Water and Electric Board is expanding into suburban areas which Mountain States Power has been serving.

Governor Dewey of New York testifies before Senate Public Works Committee on state plan for developing additional power at Niagara . . . Connecticut PUC orders utilities to take precautions to minimize service interruptions during emergencies.

**Central Illinois Public Service Co** has asked Illinois Commerce Commission approval to increase rates about $4,260,000 a year (residential, $2,266,000; commercial, $887,000; and industrial, $1,112,000).

**Off the New England Wire**—Hartford Electric Light's employee course of six evening sessions in three weeks covering distribution transformers was completed recently by 61 men in that department . . . Connecticut L&P's survey of public opinion shows that 95% of its customers think highly of the company's services. Service interruptions due to severe ice storms last winter increased complaints by 2%. Treatment of customers by employees won 95% approval. Over half the customers know that rates are regulated and consider profits reasonable. Company is working on plans to systematize cooperative tree trimming and planting in its area.

**Off the West Coast Wire**—BPA tells Pacific Northwest power pool the big upper basin reservoir at Hungry Horse dam is expected to have 2.3 million acre ft of usable storage at beginning of storage drawdown season in mid-September as compared to an estimate of 2.0 million acre ft originally scheduled for 1953-54 winter season.

After four months of negotiations IBEW-AFL workers have struck against the Cheyenne Light, Fuel & Power . . . California Oregon Power gets California PUC approval to borrow up to $7 million from four banks.

**Stevens County PUD,** Colville, Wash., files condemnation suit against Washington Water Power properties in the county, proposing to pay a figure it rejected as too high five years ago. In a similar suit in 1948 a jury priced the transmission facilities and a hydro plant on Colville River at $2.5 million but the PUD let matters drop. Now the PUD plans to take over the facilities by floating 30-year revenue bonds.

**Circuit Judge W. B. Ardery** tells Kentucky Utilities to prove the validity of signatures on its petition for renewal of its power franchise in Paris. Company contends it has enough to support calling a vote of Paris citizens on the issue . . . Village Council at Hudson, Ohio, is considering selling its municipal electric distribution system.

**Off the Washington Wire**—Virginia E&P is asking FPC approval for increasing the authorized installed capacity at the Roanoke Rapids project from 91,000 kw to 100,000 kw . . . Former FPC Chairman Leland Olds, more recently employed by Interior Department, has left government service and is now associated with Public Affairs Institute in Washington. PAI is an independent, liberal research organization which publishes an occasional study of current problems . . . Council of State Chambers of Commerce cites recent court, administrative and legislative decisions as evidence that "American socialism is creeping backward."

**NRECA board** adopted a resolution last month to use the association's legal resources to uphold the copyright fight of the symbol "Willie Wiredhand" in a suit brought by Ash Collins, creator of "Reddy Kilowatt."

**Strike on Central Maine Power system** is averted by agreement between the company and IBEW-AFL. Negotiations began last April and the latest contract expired in May. Terms will not be made public until IBEW locals vote but company's latest offer exceeds previous one.

**City of Ava, Mo.,** gets PSC approval to buy the distribution system there from Sho-Me Power Corp for $100,000 . . . Union Light, Heat & Power gets Kentucky PSC approval to sell its North Kentucky water properties to Commonwealth Water Co for $504,525 . . . Oklahoma G&E begins working out of its new one-story headquarters at Belle Isle Park which cost $220,000.

**John H. McCarthy,** Michigan PSC chairman, is named to a six-man committee to study the legislative problems associated with production of electricity from atomic energy. AEC has approved the study.

**Oregon Public Utilities Commissioner** Charles H. Heltzel orders public hearing on customer surcharges to resume Aug. 24 when private utility officials will take the stand to fill in the record and company attorneys will cross examine other witnesses called during earlier June-July sessions.

**Ohio electric co-ops** served 102,675 customers at Dec. 31, 1952 as compared to only 936 in 1936. They had $43.9 million invested in plant at year end. Since 1935 they have borrowed $40.9 million and repaid on principal $10.3 million. Taxes for 1952 amounted to $553,399.

**Congratulations**—California-Pacific Utilities promotes E. K. Albert from vice president and chief engineer to executive vice president and elects E. E. Kime, vice president in charge of the Eastern Oregon Division of company, a director, succeeding C. E. Bramble, deceased . . . Leeds & Northrup Co advances I. Melville Stein from executive vice president to president, succeeding Charles S. Redding who becomes board chairman. D. H. Schultz, who has been secretary and treasurer since 1940, succeeds Stein as executive vice president while retaining the duties of treasurer.

*(Continued on page 10)*

# Congress Clears Power Funds Bills

**Lawmakers direct Interior to make important policy changes in appropriations measure and report accompanying it**

Sizable cutback in the federal power program was apparent as Congress last week began clearing its first appropriations bills of the year.

While the trend was downward from both the Truman and the Eisenhower Administration budgets, there were exceptions:

- Congress approved the $178.4 million power facilities budget of Tennessee Valley Authority exactly as the Eisenhower Administration had requested, but some $60 million below the Truman budget (See Table I).
- Congress actually increased funds available for rural electrification loans above requests by both Truman and Eisenhower Administrations (Table II).

More typical was the appropriations bill for Army Corps of Engineers big multipurpose dams including power generators (See Table III). Biggest percentage cut was made by the new Republican Administration. Still another sizable cut was taken by the House, but much of this was restored by the Senate. Outcome of the $215.4 million item was just $23 million less than requested by Eisenhower.

Congress appropriated some $184.6 million for Interior Department agencies which develop or market electric power. Together with the $42.1 million available from carryover funds and unobligated balances, this will give the agencies just $3 million short of the amount requested by the Republican Administration. The Congressional allocation, however, is $72 million less than the amount asked in the former Truman Administration budget (See Table IV).

## Policy Decisions

More important from a power standpoint, Congress directed several important departures from the policies of past Democratic administrations. The Interior bill and report accompanying it contained these points:

- Specified that no part of the $1.6 million continuing fund for Southwestern Power Administration may be used to implement existing contracts with rural electric cooperatives for the lease-purchase of transmission or generating facilities.
- Directed the Secretary of Interior to eliminate "the inequity in surcharges" such as those levied against utility customers of the Bonneville Power Administration during critical water conditions last winter.
- Prohibited the use of funds for switchyard facilities at the Palisades hydro project in Idaho or for power plants at the Weber Basin project in Utah.
- Directed the Secretary of Interior to investigate fully the Reclamation Bureau-Sacramento Municipal Utility District power sales contract to make sure it brings a reasonable return to the government for sale of Central Valley Project power in California.

In its present form, the continuing fund restriction appears to invalidate the series of contracts negotiated in

## Power Budgets for TVA, REA, Corps of Engineers,

**Table I—TVA Power Facilities**

| | Truman Budget | Final |
|---|---|---|
| | (Millions of Dollars) | |
| Projects under construction | 191.6 | 160.6 |
| New Facilities | | |
| Fulton Steam Plant Units 1 and 2 | 30.0 | 0.0 |
| John Sevier Plant Unit 3 | 8.8 | 8.8 |
| Kingston Unit 9 | 9.0 | 9.0 |
| **Total** | **239.4** | **178.4** |

**Table II—REA Electrification Loan Authorizations**

| | Truman Budget | Eisenhower Budget | Final |
|---|---|---|---|
| | (Millions of Dollars) | | |
| Electrification Loans | 135.0 | 95.0 | 135.0 |
| Contingency Funds | 60.0 | 60.0 | 45.0 |
| Carryover Estimate | | 32.0 | 29.9 |
| **Total** | **195.0** | **182.0** | **209.9** |

**Table III—Army Corps of Engineers Multipurpose Projects**

| Project | Truman Budget | Eisenhower Budget | House | Senate | Final |
|---|---|---|---|---|---|
| | (Millions of Dollars) | | | | |
| Blakely Mountain (Ark.) | 6.0 | 5.5 | 5.5 | 5.2 | 5.2 |
| Bull Shoals (Ark.) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Folsom (Calif.) | 14.8 | 9.8 | 8.0 | 9.0 | 8.8 |
| Jim Woodruff (Fla.) | 10.4 | 7.9 | 7.0 | 7.5 | 7.3 |
| Buford (Ga.) | 19.1 | 8.5 | 5.0 | 8.0 | 7.5 |
| Clark Hill (Ga.) | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Albeni Falls (Ida.) | 7.7 | 7.2 | 6.0 | 6.8 | 6.8 |
| St. Marys Power Plant (Mich.) | .2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Table Rock (Mo.) | 10.8 | 0.0 | 0.0 | 3.5 | 1.0 |
| Gavins Point (Neb.) | 17.8 | 12.1 | 10.0 | 11.2 | 10.3 |
| Kerr Dam (N. C.) | 1.5 | 1.5 | 1.5 | 1.4 | 1.4 |
| Garrison (N. D.) | 39.0 | 31.0 | 27.0 | 29.0 | 27.5 |
| Tenkiller Ferry (Okla.) | .3 | .2 | .2 | .2 | .2 |
| Detroit Reservoir (Ore.) | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| McNary Lock and Dam (Ore.) | 28.2 | 27.7 | 25.0 | 27.7 | 26.3 |
| Lockout Point (Ore.) | 20.3 | 20.0 | 18.0 | 18.0 | 18.0 |
| The Dalles (Ore.) | 58.4 | 37.4 | 29.3 | 34.0 | 32.0 |
| Fort Randall (S. D.) | 22.7 | 14.7 | 11.0 | 13.6 | 11.5 |
| Oahe Reservoir (S. D.) | 14.8 | 8.3 | 8.3 | 8.3 | 8.3 |
| Cheatham Lock and Dam (Tenn.) | 5.8 | 4.8 | 3.0 | 4.0 | 3.0 |
| Old Hickory (Tenn.) | 18.0 | 12.6 | 12.6 | 11.9 | 12.6 |
| Dam B, of Neches-Angelina River (Tex.) | .7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Chief Joseph (Wash.) | 30.0 | 25.0 | 23.0 | 23.7 | 23.4 |
| Ice Harbor (Wash.) | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Total Multipurpose Projects** | **327.0** | **238.4** | **194.7** | **227.3** | **215.4** |

1950 between SPA and five Missouri generating and transmission cooperatives. These contracts were upheld by a federal district court in June (EW, June 29, p. 66), but lack of funds to carry them out appears to scrap them.

The SPA continuing fund was set up to allow the agency to purchase steam-generated power and lease transmission lines in connection with its power marketing activities. In the conference report adopted last week, Congress prohibits the use of this fund after Feb. 28 of next year.

In the same report, BPA is told to work out arrangements under which all utility customers will bear their proportionate share of steam generation costs in critical water periods. Last winter, private utilities in Oregon bore almost all of the abnormal steam costs arising out of the critical power shortage in the area. These utilities own and operate the steam plants, but the output is fed into the Northwest Power Pool and all pool members share equally in its benefits.

Sign that electric companies will play a larger role in disposal of federally produced power is apparent in the language restricting installation of electric facilities at the Palisades and Weber Basin project. Utah Power & Light Co offered to build the Palisades switchyard and it appears that this offer is receiving more serious consideration.

Congress voted BPA $387,000 for acquisition of the Lookout Point-Oakridge line in Oregon, but insisted that the agency not enter contracts to acquire rural electric co-op or public utility district facilities in the future.

Also included in the final funds legislation is $7.7 million for continued construction of the Eklutna project in Alaska.

For the Missouri Basin transmission system, the final bill did not include the $300,000 programed by the Senate for the Watertown-Granite Falls-Benson-Fergus Falls line in Minnesota.

## and Interior

**Table IV—Interior Department Power Agencies**

| | Truman Budget | Eisenhower Budget | Final |
|---|---|---|---|
| | (Millions of Dollars) | | |
| Southeastern Power Adm. | | | |
| Construction ... | 6.7 | 0.0 | 0.0 |
| Operation & Maintenance. | 1.7 | 1.6 | 1.1 |
| Southwestern Power Adm. | | | |
| Construction ... | 1.5 | 0.0 | 0.0 |
| Operation & Maintenance. | 1.9 | 1.7 | 1.6 |
| Continuing Fund | 5.7 | 3.7 | 1.2 |
| Bonneville Power Adm. | | | |
| Construction ... | 55.2 | 47.2 | 38.9* |
| Operation & Maintenance. | 7.4 | 7.1 | 6.0 |
| Bureau of Reclamation | | | |
| Construction ... | 193.8 | 145.0 | 116.3† |
| Operation & Maintenance. | 24.8 | 23.2 | 19.5 |
| **Total** ..... | **298.7** | **229.5** | **184.6** |

* Does not include $3 million in carryover funds.
† Does not include $39.1 million in carryover funds and unobligated balances.

### Corps of Engineers

Congress provided money to carry on most of the large Corps of Engineers multipurpose projects, but at a slower pace than had been planned by the former Democratic Administration.

The "no new starts" policy of the Eisenhower Administration was followed thus killing plans for initiation of construction on the huge Ice Harbor and Detroit projects in the Pacific Northwest.

For all practical purposes, work was halted on the controversial Table Rock project in Arkansas and Missouri. Congress allowed $1 million for construction, but restricted use of this amount until extensive studies have been submitted on power needs and project costs.

### TVA Funds

Congress followed to the letter the Eisenhower recommendations for TVA power funds. Out is the proposed 450,000-kw steam plant which the agency has planned to build just north of Memphis. A general stretch-out in power expansion is set under the reduced appropriations.

The $178.4 million voted by Congress for this fiscal year compares with a $346.6 million power budget which the agency had for the fiscal year which ended June 30.

### REA Loans

Congress's generous attitude toward the farmers is believed to account for the liberal treatment accorded the REA loan authorizations. Congress approved new funds for rural electrification loans totalling $180 million. This together with an estimated $29.9 carryover amounts to $209.9 million, which will be available for distribution, transmission and generation loans during the present fiscal year.

This larger amount was approved by Congress after Republican REA officials had plainly told Congress that it planned to loan no more than $120 million for present and future rural electrification.

### AEC Money

Of the total $1,057 million appropriated for the Atomic Energy Commission, $166 million was earmarked for new construction. Only $7 million was made available for research, development, and initiation of construction on a power reactor.

## For 3-Dam Plan

### Former Corps of Engineers official testifies Idaho Power scheme for Snake River is best

Idaho Power Co last week finally replied to one of the more troublesome arguments against its newly proposed three-dam power development of the Hells Canyon stretch of the Snake River.

The argument is that federal studies have generally recommended a high dam development at the Hells Canyon site. This was a key issue as Federal Power Commission hearings on the Idaho Power application went into the fourth week.

**Company Case . . .** Testifying for the company, former Deputy Chief of Engineers Thomas M. Robins made these points:

- The high Hells Canyon development has been included in the so-called main control plan "as a last resort" because of opposition to two other superior sites by farming and fishing interests.
- The three-dam plan with the storage in the upper dam and the remaining head developed by two downstream dams is, in Robins' opinion, the "most economical and best plan."

Robins told FPC Examiner William J. Costello that he had submitted numerous official reports on Columbia and Snake River developments during his 30 years with the Corps. He presented the following analysis of the relative costs and power capabilities of the high and low dam plans on the

basis of either being constructed as a federal project:

| | Idaho Power 3-dam plan | Federal high-dam plan |
|---|---|---|
| Capital Cost | $163 million | $422 million |
| Prime Capability | 633,000 kw | 842,000 kw |
| Annual Cost Per Kw of Prime Power | $12 | $24 |

**AFBF Gives Boost . . .** Opponents of the Idaho Power application received a boost from the powerful American Farm Bureau Federation. Matt Triggs, representing the federation, asked FPC not to issue a license to the company until it was assured that the three-dam development would produce economical power for phosphate processing in Idaho.

AFBF also wants a condition written into the license, if and when it is issued, which would assure an adequate supply of power for development of the phosphate deposits, at minimum and non-discriminatory rates.

Triggs said his organization is interested in the phosphate development because the mineral is needed for fertilizer and several state farm bureaus have an ownership interest in the Idaho deposits through the Central Farmers Fertilizer Co.

**Company Makes Points . . .** Two other company witnesses described estimates of future upstream water depletion from irrigation of new lands. Their general conclusion: Upstream irrigation demands will increase at such a rate during the next 50 years as to interfere with the storage demands of a high dam at Hells Canyon.

Idaho reclamation engineer Mark R. Kulp estimated that irrigated acreage in the Snake River basin will increase at a rate of 30,000 acres per year until 1985.

Harry M. Dewey of Twin Falls, Idaho, former deputy reclamation commissioner of Idaho, testified the development of upstream storage on the Snake will make the high dam impractical.

"If federal agencies are interested in protection of the Columbia River from floods," Dewey said, "they should explore the possibilities of multiple-use projects on the Clearwater and Salmon Rivers. . . ."

L. B. Cowgill, coordinating engineer for the Northwest Power Pool, also testified on the operations of that organization.

**SERVICEMAN** for Eugene Water and Electric Board hooks up first customer for city utility in an area which previously had been the exclusive territory of Mountain States Power Co

# Oregon Municipal Spreads Out

## Eugene Water and Electric Board engages in direct competition with Mountain States Power in suburban areas

The Eugene Water and Electric Board, Oregon's largest municipal electric utility, has embarked on an electrical expansion program in direct competition with the Willamette division of Mountain States Power Co in two suburban areas which the publicly owned system now serves only with water.

Oregon does not have a francise law granting exclusive utility rights. As a consequence any agency, public or private, can elect to undertake electric utility service in competition with any other.

EWEB explains its venture climaxes three years of negotiations with the private company toward acquisition of MSP properties in the Eugene area valued at about $500,000. EWEB estimates these properties serve 2,000 commercial and residential customers paying the private utility $150,000 annually.

EWEB officials, emphasizing the board plans to continue efforts to buy Mountain States' facilities, said "we reluctantly have come to the conclusion that these facilities cannot be acquired by purchase. We have, therefore, determined to construct facilities of our own to serve persons in the area who have petitioned for it."

**Marked Change . . .** In a statement of policy, EWEB admits the direct competition with a private utility is a marked change in past programming, but states basic reason for this change is certainty that the areas will in time become a part of the city of Eugene. The municipal system has ventured beyond corporate limits in the past, extending lines to customers not served by either MSP or the neighboring Springfield municipal system. Officials declared petitions bearing the names of over 1,200 residents of the two

areas have requested EWEB service. Presumably these will be taken into the Eugene system as lines are extended and completed.

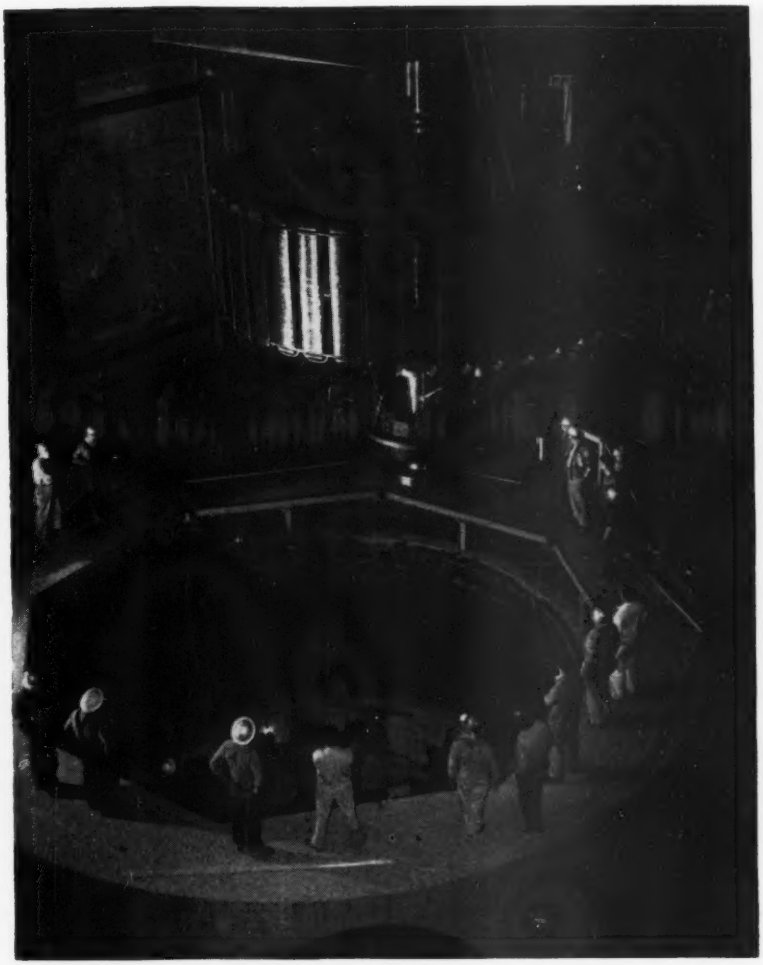
By mid-July EWEB had hooked up 17 homes formerly served by MSP and was pushing line construction in the one area lying just north of Eugene where a new bridge across the Willamette River has stimulated suburban development. The second area lies between Eugene and Springfield and brings EWEB close to Springfield's municipal lines.

**Explanation . . .** At the time EWEB's directors decided to duplicate MSP facilities, the five-member board issued a statement of explanation:

"We have a responsibility to our owners to direct the operations of the utilities as effectively and efficiently as possible. It is only logical that we can save the city a large sum of money by acquiring the areas now. If we wait until the districts are officially annexed, the amount of the Mountain States investment will be substantially increased and the cost to us to acquire the property will be correspondingly increased. We would be doing a considerable disservice to the people of Eugene, who, of course, own the utilities, if we did not make every effort to acquire this property now."

EWEB officials state the municipal system's rates are about 1.2¢ per kwhr compared with 1.6¢ for Mountain States' customers. The lower EWEB rate includes a 10% surcharge imposed for service outside the corporate Eugene limits and officials noted that the MSP figure does not include the 20% surcharge levied by the company in Lane and Linn Counties during the past winter's hydro-shortage when Oregon Public Utilities Commission authorized recovery of "excess steam costs" needed to maintain loads.

**Trimble's Views . . .** Mountain State's Pres A. W. Trimble reported from the company's Albany headquarters that EWEB had renewed its purchase offer during an early July conference. He reported that relations between the Eugene system and MSP in its fringe contacts had always been good in the past. Trimble added that in his opinion the controversial steam-cost surcharge of last winter was a definite factor in encouraging the MSP customers in the areas to look toward the Eugene Water and Electric Board as a remedy.



## Fitting a Rotor into a Stator

Power supply in Northwest is being increased this summer by addition of new units at Hungry Horse Dam. A rotor is shown being placed in a generator stator in above picture. Third generator at Hungry Horse went on line July 17 and the fourth is expected to go into operation early this month. The four units will produce 285,000 kw. Project construction program is scheduled for completion by Nov. 1.

## NRECA Will Fight Move to Boost Interest on Loans

National Rural Electric Cooperative Association will fight any attempt to increase the present 2% interest rates on government loans for rural electrification.

Board of directors of NRECA went on record against an interest hike at their summer meeting in Old Point Comfort, Va., late in July. The 35 directors present voted to create a 3-member study group to survey financial problems of Rural Electrification Administration borrowers. This committee, headed by W. Gordon Loveless of Vermont, vice president of NRECA, will study interest rates, depreciation, and amortization practices and render its report early next year.

Average cost of money for the federal government is now running slightly above 2%, but on longer-term bonds the rate is less. Interest rate at which REA loans funds to rural co-ops is now fixed by law at 2%, but there has been talk of raising this at least to correspond to average cost of money to the government. This is opposed by NRECA.

# THE ELECTRICAL WEEK

CONTINUED

**Seaborn Lee Digby,** former Louisiana conservation commissioner, was named last week as a Democratic member of FPC. He succeeds Oklahoma Democrat Harrington Wimberly whose term expired June 22. Digby is a former city attorney and district judge in Louisiana . . . Senate Public Works Committee Chairman Edward Martin said his group would postpone further consideration of Niagara power development until next year . . . Wilbur A. Dexheimer is to take over as commissioner of reclamation sometime this week. Key Interior Department post has been vacant since departure of New Dealer Michael Straus in February.

**Duke Power** has set a subscription price of $30 a share on an offering of 208,321 common shares to be made to stockholders of record Sept. 2 . . . Ohio Valley Electric Corp has arranged through First Boston Corp to sell until Jan. 1, 1957 $360 million of 3¾% first mortgage bonds due in 1982 to 38 institutions. Sale of $60 million 4% notes due in 1967 was arranged through First National Bank of New York, acting agent for 12 banks and two pension funds . . . New England Gas & Electric Association asks SEC approval to sell 194,916 common shares and to borrow $2 million from banks . . . Bedford, Va., Town Council ups rates about 10%. Industrial rates are from 9.8% to 29.9% higher.

# IN THE INDUSTRY

In the Northwest the private-public power struggle is an enveloping one. Here is a fight so big that none can escape it. Here is a fight so important that none wants to. It is waged in every newspaper. It goes on at practically every meeting place. One of these was the annual convention of the Washington Federation of Labor held recently at Yakima.

**Labor for Public Power . . .** Ed Weston, the president, and other federation officials voiced their opposition to the merger of Puget Sound Power & Light Co with Washington Water Power Co. And from neighboring Oregon came J. P. Marr, executive secretary of the State Federation of Labor, to declare:

"Those people who are out supporting the Idaho Power Co aim to build a series of low dams on the Snake River instead of a government-constructed high Hells Canyon Dam are doing a disservice to the citizens of whatever state they happen to reside in."

Marr is also executive chairman of the National Hells Canyon Association which favors public construction.

**Governor for Private Power . . .** Washington's governor, Arthur B. Langlie, defended the power company's plan for low dams on the Snake as economical common sense. "It is time we insisted that our public officials get value for our money." The low dams, he said, would cost $133 million as compared to the $386 million high dam and would produce 96.5% as much power. He added that some federal bureaus have laid out programs to spend hundreds of millions of dollars on poorly planned projects where even their own engineers cannot agree. "Hells Canyon Dam, of all these projects, is a case where a lot of money would be spent with very poor results."

**PUD Leader Answers Langlie . . .** Frank Stewart, secretary of the Columbia River Development League and prominent in PUD circles, answered the governor. Stewart charged the private power operators with a long range conspiracy to wreck public power along with the progress of the area. He branded opponents of Hells Canyon and other proposed federal dams as "faithless gloom peddlers of rock ages."

"History shows how the Washington Water Power Co tried to stop the building of Grand Coulee Dam by filing an application to construct a smaller, low-head dam at Kettle Falls, upstream from the Grand Coulee site," said Stewart, "and now we have the identical spectacle on the Snake River. A corporation from Augusta, Me., masquerading as a locally owned, business-managed free enterprise, has filed for rights to several sites in order to keep the people from building a multiple-purpose dam which for years has been included as part of the over-all, comprehensive development of our power, reclamation, flood control, and navigation program."

Stewart charged that enemies of public power in the past month have blocked Libby Dam in Montana, Ice Harbor Dam in the Columbia Basin, and Eagle Gorge Dam near Seattle. Hells Canyon would provide some 600,000 kw additional of power, which would mean nearly 60,000 new jobs in manufacturing and service industries, with payrolls and other income totaling more than $200 million annually. He also described the proposed merger of Puget with WWP as "an unholy alliance to out-Insull Insull," creating "a giant private power monopoly exercising a life or death grip over industrial expansion in areas now served by Puget."

These comments will give the industry some idea of the intensity of the private-public power fight in the Northwest.

# TECHNICAL NOTES

ARCHER E. KNOWLTON

**Street railway disappearance** removed the bulk of heavy electrolytic to utility systems but left a multiplicity of previously obscured local corrosion problems of more complex nature but fortunately small magnitude.

**Response-time increase** is a practically inevitable consequence of attempt to increase the number of control functions within an assigned frequency band of either carrier or microwave.

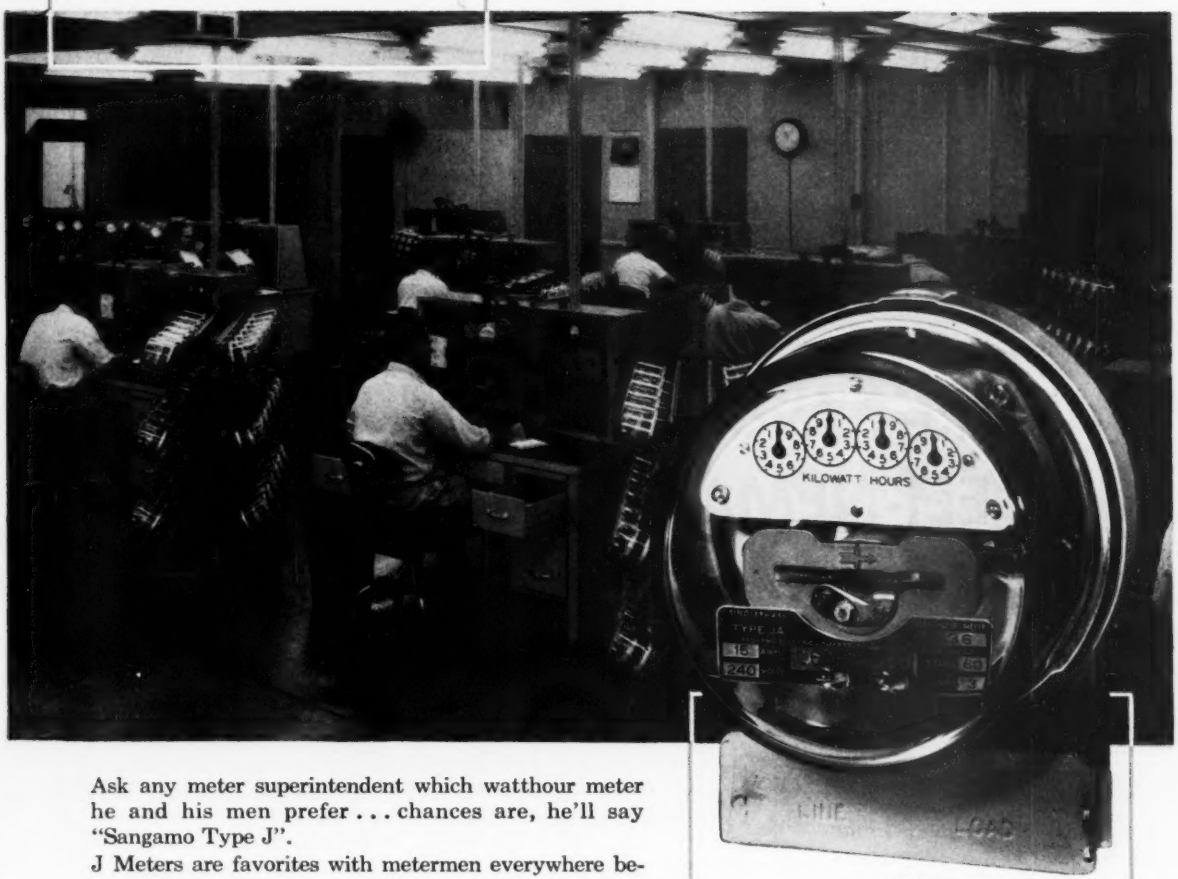
**You bet your life** against 17,000,000 to 1 odds every time you take a chance trying to save one minute of the 17,000,000 minutes still allotted you if you are about 35.

**Ordinary overcurrent relays** cannot be set low enough to afford the generator protection without risking false operation. This is because there is little difference between permissible short-time overload current and the magnitude of fault current supplied by the generator even one second after initiation of the short-circuit.

**Untaped tinned-copper** connectors for copper-to-aluminum connections for aluminum service drops have been known to develop high resistance in a few months.

*a full measure of acceptance*

**Sangamo J Meters**




Ask any meter superintendent which watthour meter he and his men prefer . . . chances are, he'll say "Sangamo Type J".

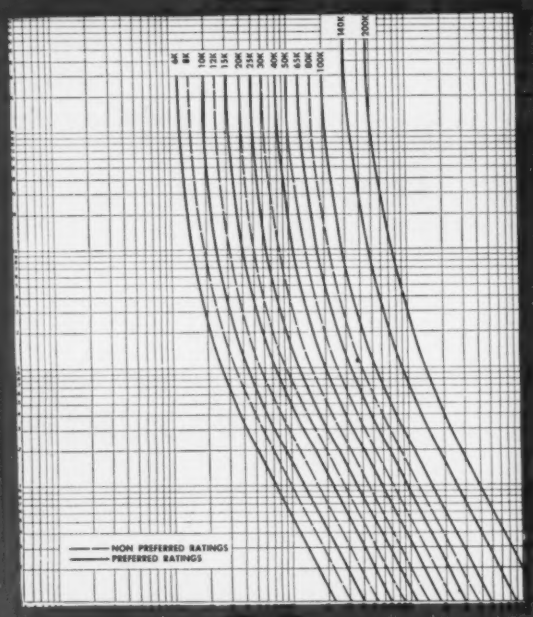
J Meters are favorites with metermen everywhere because they are easy to calibrate and they *stay* in calibration! They do facilitate the maintenance and testing program of the meter department—and they are known for extremely long troublefree service.

Sangamo J Meters are built to provide the unchanged accuracy necessary to measure all the electricity delivered over a period of many years. Careful attention to those qualities necessary for accurate measurement with minimum maintenance has always guided the design and manufacture of Sangamo Meters.

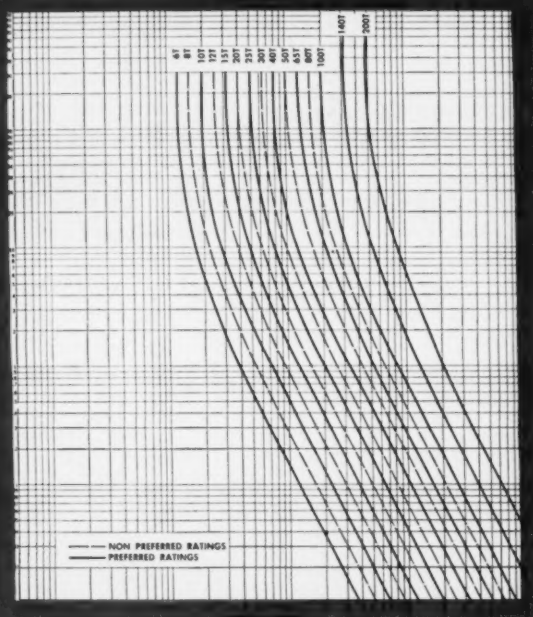
**SANGAMO**
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

*Only Measured Facts are Known Facts*

JM53-8




"K" (fast) Links—minimum melting curves. Speed ratios vary from 6 to 8.1.




"T" (slow) Links—minimum melting curves. Speed ratios vary from 10 to 13.

*Large size copies of these curves available from L-M on request*

# L-M Makes Available Complete Line Of New EEI-NEMA–Standard Fuse Links

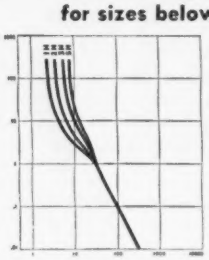
By **R. D. Cleaves**
Manager
Protective and Switching
Equipment Sales
Line Material Company

A joint project between users, represented by EEI, and manufacturers, represented by NEMA, has recently resulted in the establishment of definite time-current characteristics for fuse links. These have now been adopted as standard by the industry, in sizes covering all major operating requirements.

As a major fuse link manufacturer, Line Material Company has now made available a complete line of links meeting the new standards. L-M's new EEI-NEMA Fuse Links offer you these benefits:

1. **Industry-standard mechanical and electrical interchangeability, with assurance of uniform degrees of coordination between adjacent link sizes.**
2. **Two speeds—"K", fast, and "T", slow —with time-current characteristics to meet all major operating requirements.**
3. **Better coordination with reclosers covering a wider range of fault currents.**
4. **Simplified purchasing, stocking, and application.**
5. **Positive performance, precise electrical characteristics, and guaranteed quality.**

### New L-M High Surge Links for sizes below 6 amperes



L-M High Surge Links —minimum melting curves

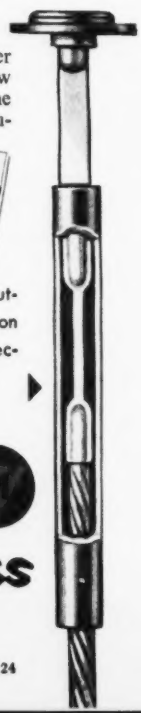
Today transformers are frequently worked up to their maximum thermal capacity. In protecting from overload, the protecting fuse link should remove the transformer from service whenever this capacity is exceeded. But it is important that the fuse link does not blow from surges and momentary overloads, causing needless outages and service trips.

Links large enough to stand these surges will not give adequate overload protection. Therefore L-M has provided a line of High Surge Links in 1, 2, 3, and 5 ampere sizes, which will stand the momentary inrush currents, and yet provide adequate protection.

These links have characteristics similar to 1, 2, 3, and 5 ampere N-rated links on the low current end, and 10 ampere N links on the high current end. These L-M High Surge Links allow good coordination with either the 10-"K" or 8-"T" EEI-NEMA links; and they supplement the EEI-NEMA-standard line.

### Get Full Information

Ask the L-M Field Engineer for details and copy of new Bulletin FC5A. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).



Rating clearly marked on button. One-piece forged button and shank. Horn fibre protective tube. Die-cast tin fusible section.

## LINE MATERIAL

## fuse cutouts and fuse links

*It's Time to Roll Up Your Sleeve—Give Blood Now*

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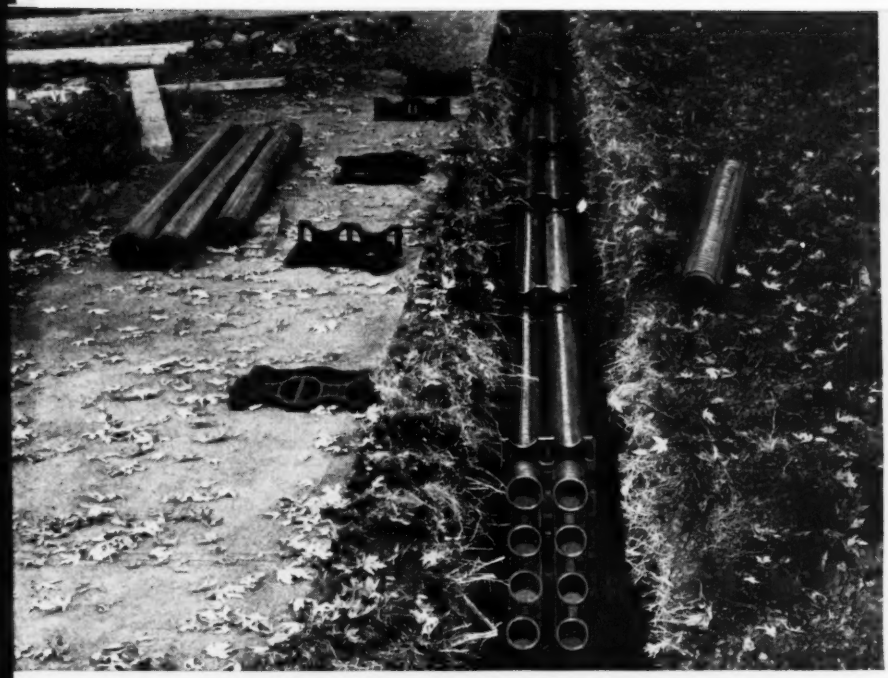


It is easy to construct a solid, well-aligned installation with L-M Fibre Conduit and "Easy-To-Use" accessories. The illustration shows use of L-M base and intermediate spacers, to assure firm, even spacing.

L-M Spacer units. Top, Intermediate Spacer, with inset showing how spacers are locked together to make 3- or 4-way combinations. Center, L-M's Base Spacer, with 3" base to give a rigid, firm foundation. Center groove is for grounding wire. Bottom: Bend Spacer Bar, used vertically or horizontally to maintain alignment at bends. 1½" square, 20" long.

# L-M's Completely Engineered System Makes Fibre Conduit So Easy To Use

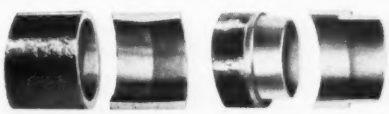
L-M Fibre Conduit has many advantages for underground installations. It's proof against corrosion, vermin, leakage; joints are easily made, without cement, and are watertight. L-M Fibre Conduit's smooth inner bore makes cable easier to pull, with minimum abrasion. You'll find it can be laid faster than many other types of duct.

In addition, L-M offers a completely engineered system for conduit installations. This includes L-M spacers, to keep installations rigid and evenly aligned; a variety of bends and fittings, including L-M's 5° couplings and 5° multi-use bend sections; the new L-M tapering tool and fibre conduit vise. Some of the L-M engineered fibre conduit fittings are shown here.

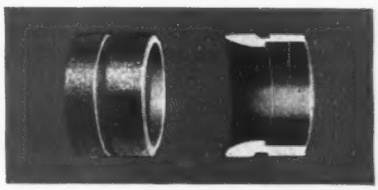
### Get Complete Information

You should have the whole story. Ask the L-M Field Engineer for a copy of the 12-point plan folder, which shows how easy it is to use the L-M system; also for our underground construction handbook and Bulletin UG-1A, which gives complete specifications. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

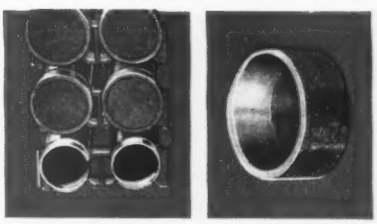
L-M provides a variety of bends. At left, 45° and 90° bends. Right, L-M's S-Bend, which provides a 20" offset without restricting drawing of cable. Special bends available on order.



The 5° angle coupling at left provides for long radius turns, and offsets. The multi-use bend section gives a 5° angle and the sections can be joined without nipples for special radius turns, crossovers, etc.



L-M's Bell Ends for use at conduit terminals in manholes provide a smoothly rounded opening that will not cut or mar the cable sheath.



L-M's Fibre Caps are accurately tapered to provide a watertight, vermin-proof seal for fibre conduit lines prior to drawing cable. Easy to remove for re-use.

141

L-M FIBRE CONDUIT
meets all of the requirements of Federal Specification W.C.581 for Conduit and Fittings, Fibre, Bituminized

# LINE MATERIAL

Fibre Conduit

# a modern version of an old standby — DELTA-STAR'S

## New "PMK"

115 KV 1200 Ampere
"PMK-23" Air Switch

"PMK" 600 Ampere
Contact Assembly

**Here is an old friend you have long been familiar with for substation and pole-top application. It now incorporates all the modern, trouble-free features which have proved so successful on other DELTA-STAR Switches.**

Large, hard drawn copper contact shoes, with oval shaped silver inlays, operate against the hard drawn copper tubular blade to form a high pressure small area contact—assuring superior electrical and thermal characteristics.

Years of wear on the contacts and blade will cause no appreciable reduction in contact pressure because of the long multiple leaf pressure applying springs of fatigue resistant beryllium copper. These springs do not function as current carrying members.

Offset arrangement of contacts combined with the blade motion develops a twisting shear, easily breaking formations of ice and corrosion.

These features **plus** all the well-known standard features demanded by engineers, a minimum number of insulators per single pole element, one contact, tubular blades, free swinging bronze ball bearing terminals, minimum side and overhead clearance, and simple mechanism.

Available in "PMK-22" the two bearing type and "PMK-23" the three bearing type, for upright or inverted mounting in all standard voltage ratings from 7.5 to 161 kv at 400, 600 and 1200 amperes.

**WHEN YOU WANT THE BEST IN HIGH VOLTAGE SWITCHING EQUIPMENT SPECIFY DELTA-STAR**

# DELTA-STAR ELECTRIC DIVISION

H. K. PORTER COMPANY, INC.
2437 FULTON STREET, CHICAGO 12, ILLINOIS
DISTRICT OFFICES IN PRINCIPAL CITIES

GOVERNOR DEWEY of New York talks with Sen Irving Ives (right) and Sen Edward Martin (left) chairman of Public Works Committee, before testifying on power development at Niagara

# Dewey Testifies on Niagara

## Governor urges approval of state development plan. Other lawmakers demand to be heard during reopened hearings

Opponents of the private enterprise bill for Niagara Falls power development appear to have halted its progress for this session of Congress.

With Washington lawmakers moving toward an early August adjournment, it is unlikely the Niagara legislation will get beyond the Senate Public Works Committee.

**Governor in Key Role . . .** New York Republican Gov Thomas E. Dewey played the key role in putting the brakes on the bill which the house voted out by an overwhelming majority earlier this month (EW, July 27, p 81). As voted by the House the measure would permit five New York electric companies to develop an additional 1.1 million kw at Niagara Falls.

Dewey moved in as the Senate Public Works Committee was preparing to take a vote on the measure. He succeeded in getting hearings reopened and appeared as the first witness to push his own state development plan. This opened the way for federal development advocates to present their case again.

**Others Ask to Be Heard . . .** By this week at least five senators and representatives were demanding to be heard on Niagara development before the committee closes its books. Senate committee members had earlier conducted joint hearings with the House on this legislation.

During his two-hour appearance before the Senate committee July 23, Governor Dewey made it clear he would use every means at his disposal to block the private enterprise development even if Congress should approve it. He threatened court action on constitutional grounds—charging that the bed of the Niagara River and use of its waters is a state property.

Democrats taunted the Republican governor by asking whether his plan might border on "creeping socialism." Replied Dewey, "If it is creeping socialism it did its creeping 40 years ago and is now full grown."

**Cheaper Rates . . .** Main point of Dewey's argument was that the state development plan would mean cheaper rates for the Niagara power. He noted that private enterprise would have to pay more than $1.5 billion dollars in taxes over a 50-year period in connection with operation of the proposed Niagara plant. This, of course, would be figured in the power rates.

Pointing to numerous other public water power developments, he continued, "If all water power in America paid federal, state, and local taxes I wouldn't have a leg to stand on. But why should my state be singled out to pay these taxes?"

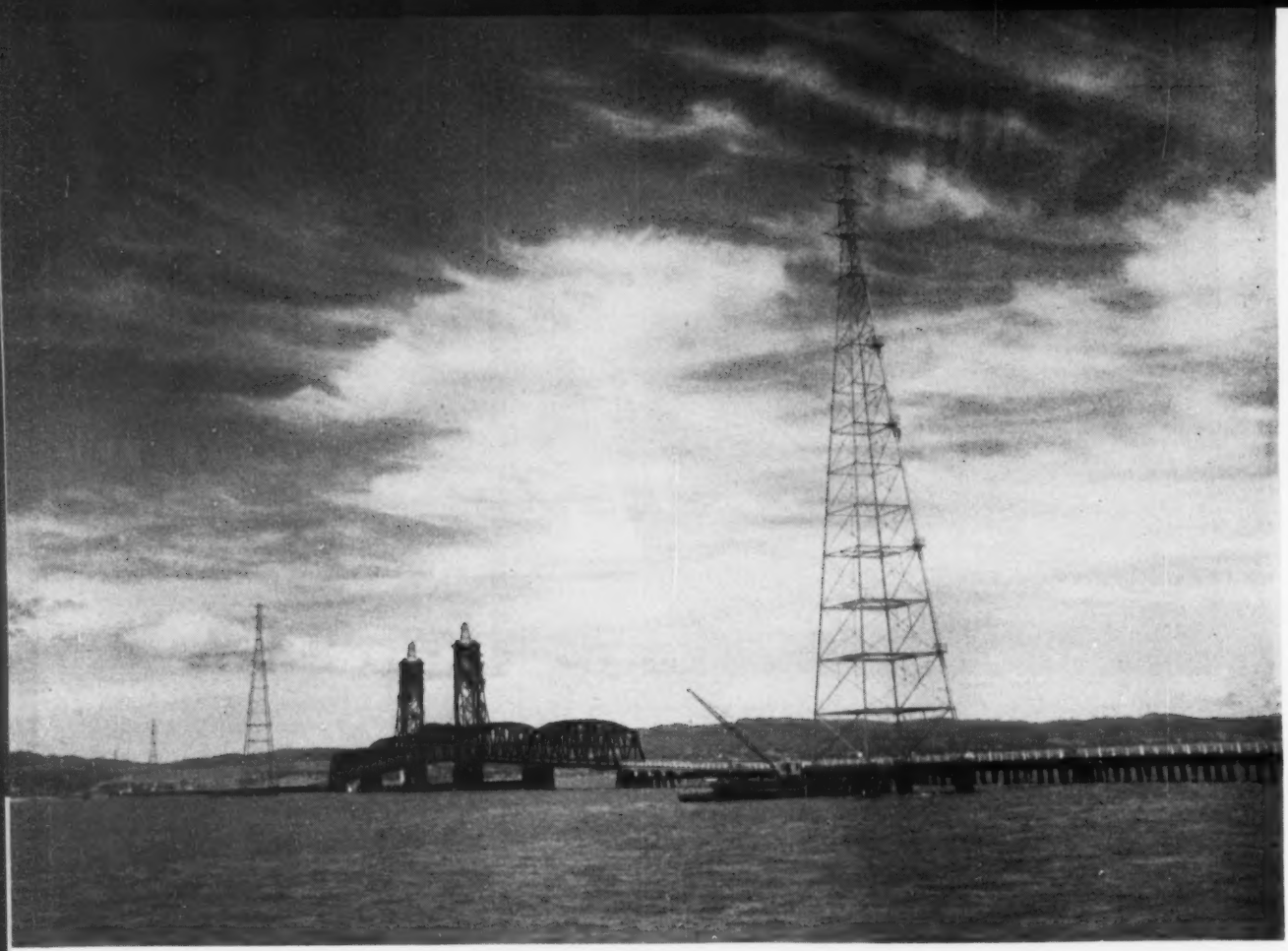
Under the Dewey plan, Power Authority of the State of New York would build and operate the additional power plants at Niagara. The Governor told the committee, "We don't ask Congress for a cent . . . all we ask is that you don't take away water power that is ours and turn it over to a private utility."

Dewey's fighting mood before the Senate committee came as a surprise to many lawmakers. The New York Governor had made no public attempt to stop the private enterprise measure in the House.

There was one possible explanation: Dewey had wanted to have his hand on the St. Lawrence power project license before getting into the complicated Niagara fray. Federal Power Commission recently approved that license. Now he is out to capture the second big power potential for his power authority.

## POWER BRIEFS

- Alabama Electric Cooperative, Andalusia, Ala., has been granted a loan by Rural Electrification Administration for $1,306,000 to finance completion of generation and transmission facilities and system improvements. Alabama Electric Cooperative is a federation composed of fifteen REA-financed distribution co-ops, six cities, and two industrial members.
- Public Service Co of Indiana has acquired land near New Albany for construction of a new power plant that may become the company's largest. Construction will probably not start before next year on the project which reportedly will have an initial capacity of 400,000 kw.
- Austria's electric power industry exported an all-time high of 1,058,000,000 kwhr in 1952, according to the Austrian information office. It was an increase of 24.6% over '51.

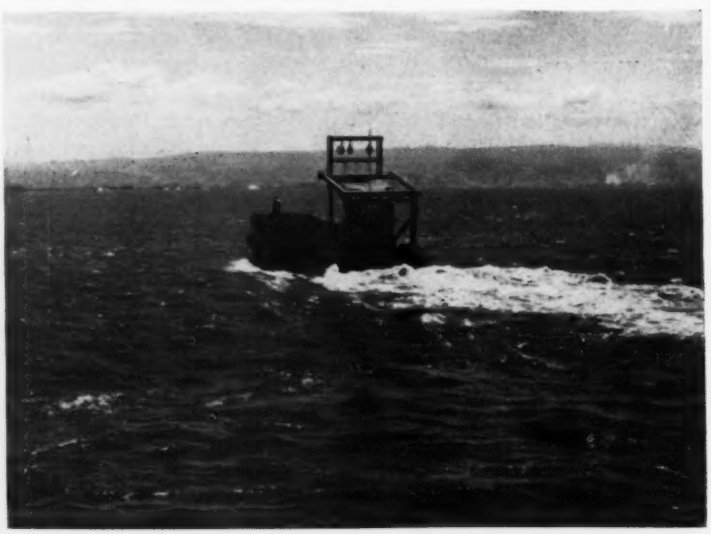


**Cable is strung between towers . . .**

**. . . by seagoing linemen . . .**

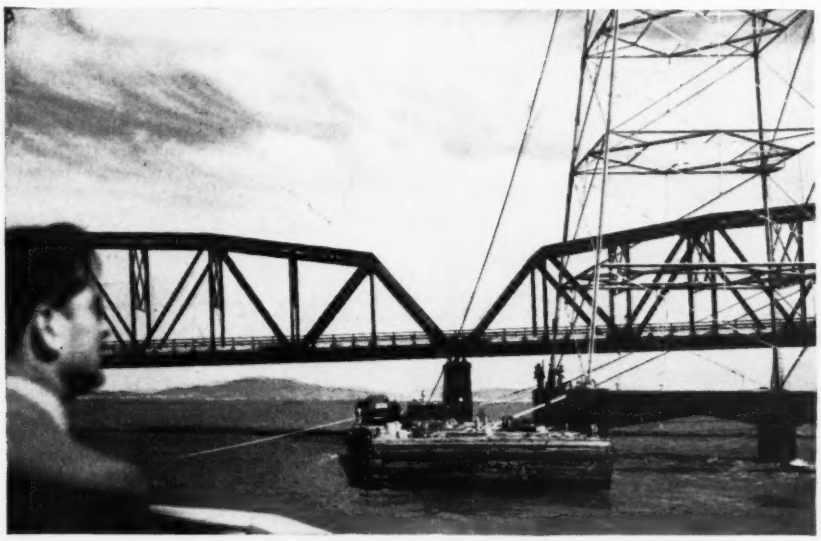
# PG&E Stages An 'At Sea'

Pacific Gas & Electric Co's new Moraga-San Mateo highline across San Francisco bay had to be raised high above a ship channel on two 300-ft towers 1,975 ft apart. Men in a radio-directed landing craft (right) strung the cable underwater, and a winch on a lighter pulled it up. The company staged a water-borne wing-ding so reporters could watch. EW's man was there, and he got pictures to prove it.



**. . . as the press looks on ➡**

**PRESS PARTY** ties up to a barge at the foot of one of the towers. There 40 reporters from the trade press and newspapers in the area watch preparations for raising ACSR conductor in the new 220-kv line. The bay is choppy, so linemen working on the barge and tower footings have to wear life jackets.



**LINE GOES UP** after the press boat backs off. Winch on tractor secured to the barge raises conductors from bottom of bay to tower arms. Deep water footings for the towers consist of four precast concrete legs 62 ft long and seven ft in diameter and four 46-ft beams. Legs and beams were barged to the site and placed by a steam derrick.

**CAMERAS SLUNG** and copy paper pocketed, the reporters "hit the beach" after a day on the bay. EW's man says the shore-briefing breakfast was good, the box lunch afloat was fine. Only one hitch, over which PG&E's public relations man had no control: A heavy tide was running, which prevented workmen from raising the conductors at the appointed press-watching time.

# Look INTO THE POLE STAR

## AND SEE WHY IT IS FAST BECOMING A *Best Seller*

**Sealed Tank Construction Throughout**

All gaskets used in the Pole Star are made of synthetic rubber. A retaining ring in the cover keeps the gasket in its properly compressed position at all times.

**Shot Blasted—*Then Painted***

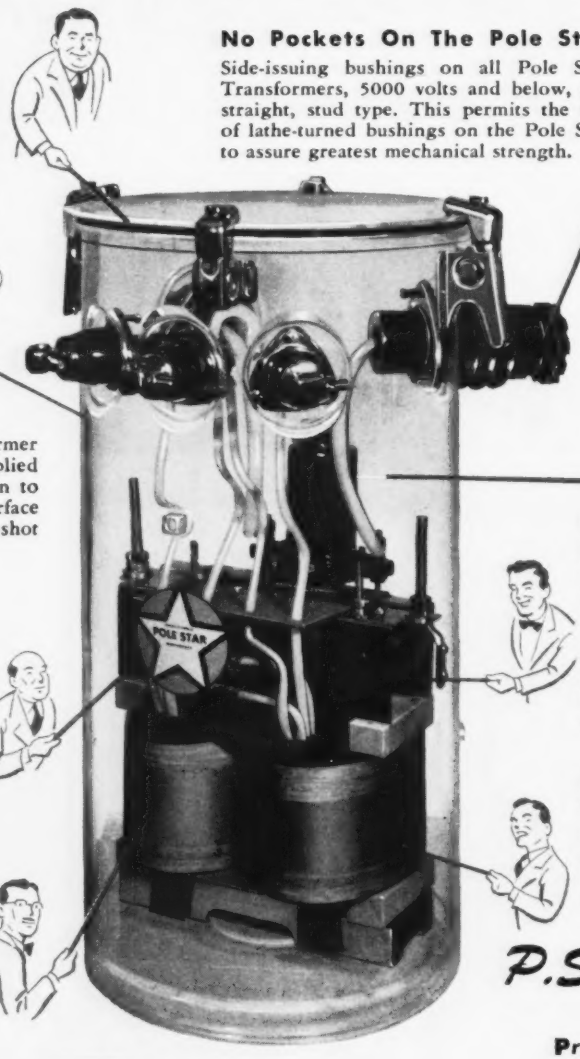
Three coats of transformer paint are individually applied and individually baked on to the tank *only after* the surface of the tank is thoroughly shot blasted.

**Low Noise Level**

The amount of contact pressure between laminations in the Pole Star core is not important because each lamination is actually a core itself. As a result, the noise level in the core is fixed at a low value and will not change.

**Core and Coil Units Easily Taken Apart and Rebuilt**

If a coil is damaged by lightning or excessive overloading, cores can be taken apart and rebuilt with replacement coils. This can be accomplished without appreciably affecting the low core loss or exciting current of the Pole Star.




**No Pockets On The Pole Star**

Side-issuing bushings on all Pole Star Transformers, 5000 volts and below, are straight, stud type. This permits the use of lathe-turned bushings on the Pole Star to assure greatest mechanical strength.

**Tap Changes Made From Above Oil Level**

The tap changer handle is above the oil level, where tap changes can be made with great ease by turning the handle to the proper tap position. White letters on black bakelite clearly show the tap positions.

**Low Exciting Current**

Laminations in the Pole Star core are individually lapped. The large cross section at the lap reduces the density and prevents a concentration of flux. As a result, the reluctance of the magnetic circuit is low. Each lamination forms its own magnetic path undisturbed by butt joints and points of high density.

**Coils Wound Independently of The Core**

Separate winding allows each coil to be tightly wound and individually treated to give it great mechanical strength.

*P.S.* Let the POLE STAR be your guide . . .

***Product Of Long Experience***

***Safe Thrifty And Reliable***

**PENNSYLVANIA TRANSFORMER COMPANY**

*A McGraw Electric Company Division*

**CANONSBURG, PENNSYLVANIA** • ***Greater Pittsburgh District***

# 'Underground' Storm Abates

## Connecticut PUC, after hearing, decides change would be too costly, but orders other disaster remedies

Placing all overhead power lines underground would increase utilities' investment 25 to 35 times and might result in rate boosts of from 500 to 600%, Connecticut Public Utilities Commission declared in a report accompanying an order directing utilities to take certain steps to minimize service interruptions during storms.

The PUC order, dated July 16, is an outgrowth of a severe ice storm which struck Connecticut Jan. 9-11 during which there were 134,797 interruptions to utility service. Gov John Lodge ordered a public hearing to determine cause and extent of damage to utility facilities and activities of the utilities during the emergency. The PUC conducted the hearing March 9-10 at Bridgeport, Conn. (EW, March 16, p 7). At that time the state legislature was considering bills to compel utilities to place their lines underground. Such legislation, however, was not enacted.

**Orders Review . . .** In view of the higher costs and other difficulties, PUC ordered utilities to review their plans for installing underground lines and "to encourage as great a use of underground construction as is consistent with sound engineering and economic principles."

Among difficulties of underground lines listed were: Constant need for opening of streets and building of manholes, difficulty in locating faults, longer outages, cost to customer of installing conduit from street to house basement, and cost to municipalities.

Other major points in the commission's order directed utilities to make provision for receiving more accurate information on weather forecasts, to study use and development of aerial cable, and to meet with tree protective associations to work out a program to lessen damage to wires from trees.

**Ten Steps . . .** The commission ordered:

**"1.** That some organization be established by the electric and communication companies as a nucleus for a central organization for handling emergencies such as experienced during this storm. This organization can be used for the gathering of weather data, keeping up-to-date lists of key utility personnel and outside contractors, dispatching, setting up a central point of information relative to critical areas, and assigning of crews.

**2.** That the companies individually, or as a group, obtain competent meteorological forecasting and analyzing services by contract or by employment of full time trained personnel.

**3.** That a specific plan for cooperation between the companies affected and local and state governmental and police authorities and civil defense authorities be completed, which plan will include provisions for exchange of services, information and when necessary facilities, and will be opened for revision and modification at least once a year and which plan will be filed with the commission.

**4.** That a joint committee composed of representatives of the companies and the Tree Protective Association and other similar associations meet at least annually and that within two years a specific joint proposal for cooperative action be reached and filed with the commission.

**5.** That each company undertake as part of its program of plant improvement a review of its plan for installation of underground facilities, to encourage as great a use of underground construction as is consistent with sound engineering and economic principles.

**6.** That all electric utility companies begin a joint study of the use and development of aerial cable, reporting to the commission within six months the progress of the development and at least annually thereafter until relieved by the commission, after due cause shown.

**7.** That the companies make an immediate and complete survey of their entire systems to disclose sources of potential difficulty and report the results to the commission. Within three months after such report, the companies shall disclose to the commission steps taken to eliminate these difficulties.

**8.** That all electric companies owning and operating transmission lines shall inaugurate a program of inspection of ground and phase wires after each lightning season. That the design practices with respect to sagging of ground wires and conductors be reviewed to eliminate as much as possible ice loaded ground wires making contact with conductors.

**9.** That the electric companies formalize the existing working arrangements presently in effect at times of emergencies similar to the mutual assistance agreement in force between electric companies and The Southern New England Telephone Co.

**10.** That each company provide a trained member of its personnel whose duty it shall be during emergencies to keep abreast as much as possible with the rate at which restoration of service is being carried out. It shall be his duty to provide information to the personnel answering telephone inquiries, to the press and radio, and to all other sources of publicity available to eliminate misleading or inaccurate information."

MAJ GEN BERNARD L. ROBINSON

## Corps Change

Single post of Deputy Chief of Engineers has been abolished by the Army and two new posts have been created. Maj Gen Bernard L. Robinson, former Deputy Chief, is now Deputy Chief of Engineers for Construction and Brig Gen Albert C. Lieber is Deputy Chief of Engineers for Military Operations. General Robinson will be responsible for military construction and civil works construction.

# DISTRIBUTION TRANSFORMERS

***different from others because....***

# .....Strenicor pressure terminal clamps.....

## *minimize breakage due to stress-corrosion*

Months or even years after installation, the strain imposed by tight connections may cause breakage of secondary terminals due to stress-corrosion (season cracking). This causes outages, service calls and customer inconvenience.

**METALLURGICAL STUDIES** of the causes of stress-corrosion led to the development of Strenicor—a new copper-nickel-silicon alloy. After successive solution and aging heat treatments, this alloy provides a high tensile strength of 107,000 psi—a yield strength of 83,000 psi. Thus General Electric Spirakore* transformers with Strenicor secondary terminals are practically immune to failure by stress-corrosion.

**REMEMBER . . .** all transformers are not alike . . . compare the General Electric plus features in the chart below and see for yourself.

For more information on distribution transformers, either unit-type or conventional, contact your nearest G-E sales office, agent or distributor, or write to General Electric Company, Section 431-7, Schenectady 5, New York.

*Registered Trade-mark of General Electric Co.

*You can put your confidence in—*

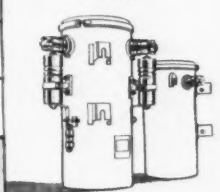
**GENERAL ELECTRIC**

**ALL TRANSFORMERS ARE NOT ALIKE**

(make this simple comparison and see)

| FEATURE | General Electric | Mfr. A | Mfr. B | Mfr. C | Mfr. D | Mfr. E |
|---|---|---|---|---|---|---|
| Production-line impulse testing | YES | NO | NO | NO | NO | NO |
| Nitrile rubber gaskets at all tank openings | YES | NO | NO | NO | NO | NO |
| Strenicor pressure terminal clamps | YES | NO | NO | NO | NO | NO |
| Insulated clamp-type connectors on tank wall hv bushings | YES | YES | YES | NO | YES | YES |
| One-piece cover band | YES | NO | NO | NO | NO | YES |
| Gapped valve-type arresters | YES | NO | NO | NO | NO | NO |
| Nationwide company-operated service facilities | YES | YES | NO | NO | NO | YES |

1878 75 1953 YEARS OF ELECTRICAL PROGRESS



UNIT-TYPE CONVENTIONAL

*"Take your choice G. E. makes both"*

## These are the men

PRES ALLEN VAN WYCK originated and financed Illinois Power's program for generating all power on the home grounds

E. S. HIGHT, vice president and general manager, has guided the expansion program's design and construction work since the start

E. A. SCHULTZ, electrical operations manager, and S. L. Hilyard, chief electrical engineer, were responsible for executing the plans

# Full Generation In Six Years

### Once the decision was made, they built capacity fast at Illinois Power

A fifteenfold increase in generating capacity since 1947 is the accomplishment that this year will enable Illinois Power Co to meet demands on its system without outside help virtually for the first time in its history.

In 1944 more than 90% of the system's energy requirements were being met through purchase of power from other utilities. At this time Illinois Power Pres Allen Van Wyck decided to undertake a program to generate enough power to meet all demands of its customers.

Before the first unit of the construction program went on the line in 1947, Illinois Power's capacity stood at 37,000 kw, demand at 298,000 kw. By the first of this year, capacity had climbed to 444,000 kw in six years' time. Today with the addition in June of a 75,000-kw unit at Hennepin Station, capacity totals 519,000 kw. By the end of this year further additions will bring capacity to 619,000 kw. With estimated demand for 1953 at 524,000 kw, Illinois Power will have capacity in excess of demand, a condition which has prevailed only once before and then only for a brief time, in 1950.

**Orderly Program . . .** When the decision to build was reached in 1944, steps were taken to terminate existing long-term purchase power contracts. Plans for a rapid but orderly construction program were developed.

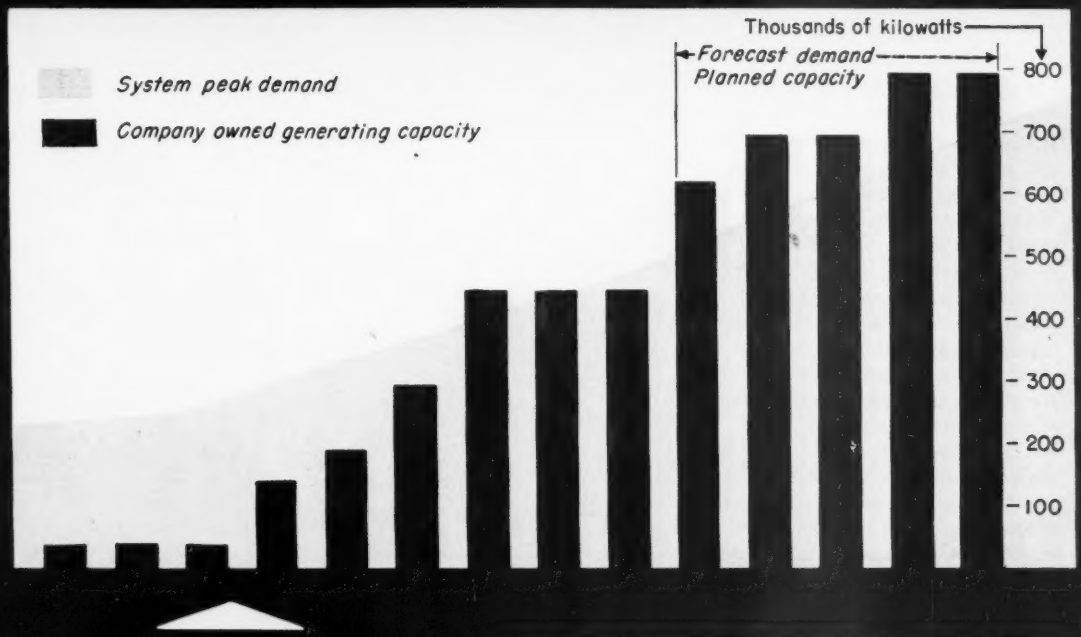
Ground was broken for the first plant at Havana in the summer of 1945. Five 50,000-kw units have been installed, the first and second going into service in September 1947, the third in 1948, and the fourth and fifth in 1950.

Before the first unit at Havana went into operation in 1947 ground was broken for a second plant on the Wood River, north of St. Louis and east of the Mississippi. Wood River's first and second 50,000-kw units went into operation in December, 1949, the third 50,000-kw unit in October 1950. The fourth, with a capacity of 100,000 kw, is scheduled for operation in November 1953.

Hennepin's first unit marks initial operation for the company's third completely new plant with only six years elapsing since the first unit of the construction program was placed in service. Already ground has been broken for a fourth new plant, the Vermilion Station, near the Indiana line northwest of Danville, Ill.

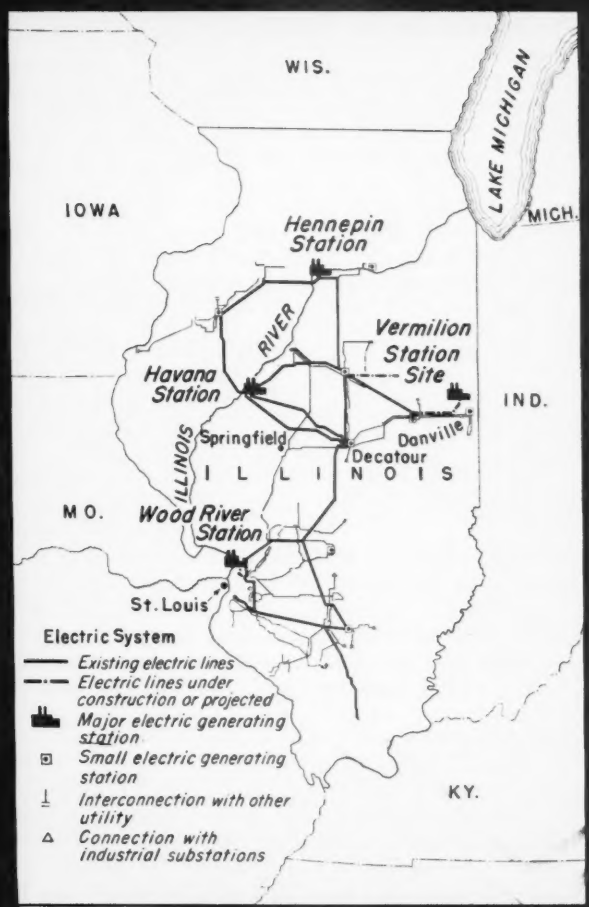
**High Efficiency . . .** The program will reach the point this year where only 6% of the capacity is over six years old and only 47% is more than three years old. Result is an unusually high percentage of generation at

# . . . and this is the job they did




**THIS YEAR** the capacity bar broke through the demand line and stayed there for the first time in the company's history. Before the first unit of the current construction program went on the line in 1947, generating capacity was only 37,000 kw scattered in a number of small plants. Demand then was 298,000 kw.

By 1952 two new plants were in operation, bringing capacity to 440,000 compared to a demand of 472,000 kw. This year, as units of the fourth large plant begin to spin, capacity will reach 619,000 kw, more than offsetting estimated demand of 524,000 kw.




**AREA SERVED** is rich farming country, into which industries have been moving at a steady pace. Company spotted four large plants around its system to meet the load: Havana on Illinois River; Wood River, north of St. Louis; Hennepin on Illinois west of LaSalle; and Vermilion, on Vermilion River west of Danville.

## THE COVER

When Hennepin Station, shown under construction, brought in its first unit this June, system capacity exceeded system demand.

plants with the high efficiencies and low manpower requirements that are only realized in modern plants. It all adds up to an overall system efficiency of 12,412 Btu per kwhr.

Plants have been well distributed. Havana, the first, was located on the Illinois River for cooling water supply and is to the west of the heavy loads of the company's central division. Wood River Station, the second in the series, is near the load center of the southern division. Hennepin is in the northern division, and the new Vermilion station is at the east end of the central division.

While plant construction was progressing, purchased power requirements went steadily downward. In 1947, the year the first new plant started operation, purchased power cost $8.25 million while electric operating revenues totaled $26.25 million. In 1952 the figures were $1.5 million for purchased power with electric operating revenues at $42 million.

**Transmission System . . .** Simultaneously with plant construction work began on development of a transmission system to tie in plants with load centers. In 1946 the system was fundamentally 69 kv and had only 75 miles of 138 kw line. Since then nearly 700 miles of 138-kv lines have been completed and by the end of 1953 this is expected to reach 800 miles. Construction by years is as follows:

| Miles of 138-Kv Line in Service | | |
|---|---|---|
| | Circuit | Pole |
| 1946 | 75.17 | 75.17 |
| 1947 | 192.17 | 192.17 |
| 1948 | 245.55 | 245.55 |
| 1949 | 436.34 | 431.76 |
| 1950 | 465.59 | 461.21 |
| 1951 | 734.00 | 726.29 |
| 1952 | 770.73 | 758.82 |
| 1953 (estimate) | 893.73 | 881.82 |

Transmission construction was speeded by mechanization and by aerial surveys of proposed routes of lines. Aerial surveying has been used on more than 500 miles of 138-kv lines. It cuts surveying time 50%.

Other factors that have made possible the rapid but orderly construction have been extensive use of consulting engineering services and contract construction forces. All power plant design has been done by consulting firms. Construction of both plants and transmission lines have been contracted. Transmission design has been handled by the company's own engineering department.

## Transformer Taken for a Long Ride

Switzerland to Buckeye, Ariz., is the route covered by this 124-ton transformer, being switched from freighter to railroad flatcar before shipment to an Arizona Public Service Co substation. The giant transformer will be the state's largest three-phase unit capable of transforming 161 kv to transmission voltages of 69,000 and distribution voltages of 12,500, according to George H. Groh, the utility's vice-president in charge of operations. The transformer, made in Switzerland, was shipped from Antwerp, Belgium, to Los Angeles via the Panama Canal.

## Tacoma City Light Lifts Ban on Electric Heating

Tacoma City Light at Tacoma, Wash. has removed restrictions on the use of electricity for heating homes, under certain conditions.

These conditions, as stipulated in newspaper advertising, follow:

"1. Because the lack of insulation will dissipate heat at a rapid rate and result in large electric bills for heating service, the contractor or customer must furnish information with regard to heat losses and the electrical capacity of the proposed heating system to show that proper protection against such heat losses has been provided.

"2. The customer must submit a statement indicating that he is aware of Tacoma City Light electric rate which applies to this kind of power use.

"3. Every customer should understand that furnishing power for lights and appliances does not make the same demand on Tacoma's system as does the furnishing of power for house heating. If the use of power for house heating becomes general, it may necessitate and justify upward adjustments in the present electric rates."

Use of electricity for heating has been discouraged during the power shortage of recent years. While power supply in the Northwest is still not enough to meet every need, the facilities of Tacoma City Light have been expanded since World War II, the utility advertised.

## Europe's Hydro Potential

Continental Europe could probably exploit its water resources to produce 20% more hydroelectric power than is now considered economically feasible, according to a report issued in Geneva last month by the United Nations Economic Commission for Europe. Possibilities for greater hydro development appear to exist in Italy, Austria, and Switzerland, and to a lesser extent in France, and Western and Eastern Germany, the report said.

# New "TC" Core

## permits 20% average weight reduction in 3-phase distribution transformers

If load growth indicates the need for a new or expanded 3-phase system . . . with correspondingly higher rated transformers . . . here's good news. Weight of Westinghouse 3-phase distribution transformers has been drastically reduced. In most cases, the original pole will support these new units, and they're easier to hang, easier to store as well. Primary reason: A new Hipersil® Core. Tests show that the new Type "TC" Core maintains excellent performance characteristics in a much more compact core-coil assembly.

For example, the new 75-kva conventional unit weighs only 1300 pounds, fits into a round tank 22″ in diameter. This contrasts with the superseded model at 1730 pounds in a rectangular tank, 18″ x 27″.

An even greater saving in size and weight of 3-phase "CSP®" (Completely Self-Protecting) units is achieved through the use of new, smaller LR circuit breakers.

Consider, as well, the advantages Westinghouse offers in "Coastal Finish", wall-mounted bushings with unbreakable "Enrup®" knobs, and inhibited oil. Call your Westinghouse representative for complete information, or write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

*Type "TC" Hipersil Cores. All the superior magnetic characteristics of Hipersil "C" Cores are retained with a T-leg added to accommodate 3-phase coils.

J-70675

YOU CAN BE SURE... IF IT'S

Westinghouse

***Helping the industry meet its growing loads***

# *Solved:*
# *A long-time problem in high-voltage switching*

A low-cost switch to *safely* interrupt load currents on high-voltage transmission lines has long been the need of utility engineers. Conventional disconnects are not suitable for this job because of the ever-present danger of an unconfined arc causing a fault.

Now, after a great deal of interesting research, Westinghouse engineers have developed the VLB switch which not only safely interrupts load current, but also line-charging currents and transformer magnetizing current.

The VLB switch is essentially a standard disconnect with the addition of a small interrupter chamber. The interrupter chamber, permanently sealed and gas filled, houses the contacts which are the current interrupters. These contacts are actuated by a quick-break mechanism which, in turn, is tripped by the main switch blade as it rises, after being released from the stationary contact jaws.

Development of the VLB switch was complicated by the factors that had to be considered—weight, size and cost. These requirements were met by the use of sulphur hexafluoride, $SF_6$, halogen compound gas, with an arc interrupting ability *100 times better than air*. Less than six inches of contact separation are required in $SF_6$ at atmospheric pressure to interrupt 115-kv circuits. Interruption is further improved by application of the De-ion® principle: small puffers blow fresh un-ionized gas through the arc when the contacts open.

The great expansion in today's power systems makes the new VLB switch all the more timely. It is another good example of constant efforts by Westinghouse to provide the utility industry with quality equipment designed to help solve operating problems.

J-97175

YOU CAN BE SURE...IF IT'S
Westinghouse

### *The intriguing properties of sulphur hexafluoride*

The superior dielectric qualities of many of the halogen compound gases have become known to science during the last 15 years. Of particular interest to Westinghouse scientists is sulphur hexafluoride ($SF_6$) which is extremely stable and inert, remains a gas down to comparatively low temperatures (–62°C at normal pressure), and is comparable with oil in dielectric strength at only 30 pounds per square inch gauge pressure. Using these known qualities, it wasn't long until the engineers discovered, with the aid of a small test interrupter, that the currents which could be interrupted in $SF_6$ were 100 times greater than with air!

The arc quenching ability of $SF_6$ is far out of proportion to its straight insulating ability as compared with air. This results from the fact that the main factor to consider in arc quenching is not so much the dielectric strength of the medium used as its *rate of recovery* of dielectric strength, near current zero. It is the high rate of recovery of dielectric strength of $SF_6$ which makes it more desirable than air or the other halogen compound gases for arc quenching. A discussion of $SF_6$ entitled *An Investigation of the Arc-Quenching Behavior of Sulphur Hexafluoride* has been put in pamphlet form by Westinghouse engineers. Write for a copy.

### *Gas lasts life of switch*

The interrupter is permanently sealed with 30 psi of gas pressure. It will interrupt nameplate rating at only 15 psi gas pressure, thereby assuring long life and dependable operation. Pressure is shown on a gauge which can be read from the ground. Since practically no gas is used in the interrupting operation, it is not anticipated that any recharging with gas will be necessary during the life of the switch.

### *100 miles, 600 amperes, or 100,000 kilovolt-amperes*

The VLB switch is available in ratings from 7.5 kv to 115 kv with a continuous capacity of 600 amperes. This means that the VLB can be used for interrupting load current of 600 amperes, charging current for 100 miles of line, and magnetizing currents for transformer banks up to 100,000 kva. Since it requires only slightly more space, the VLB can be used to replace conventional disconnects.

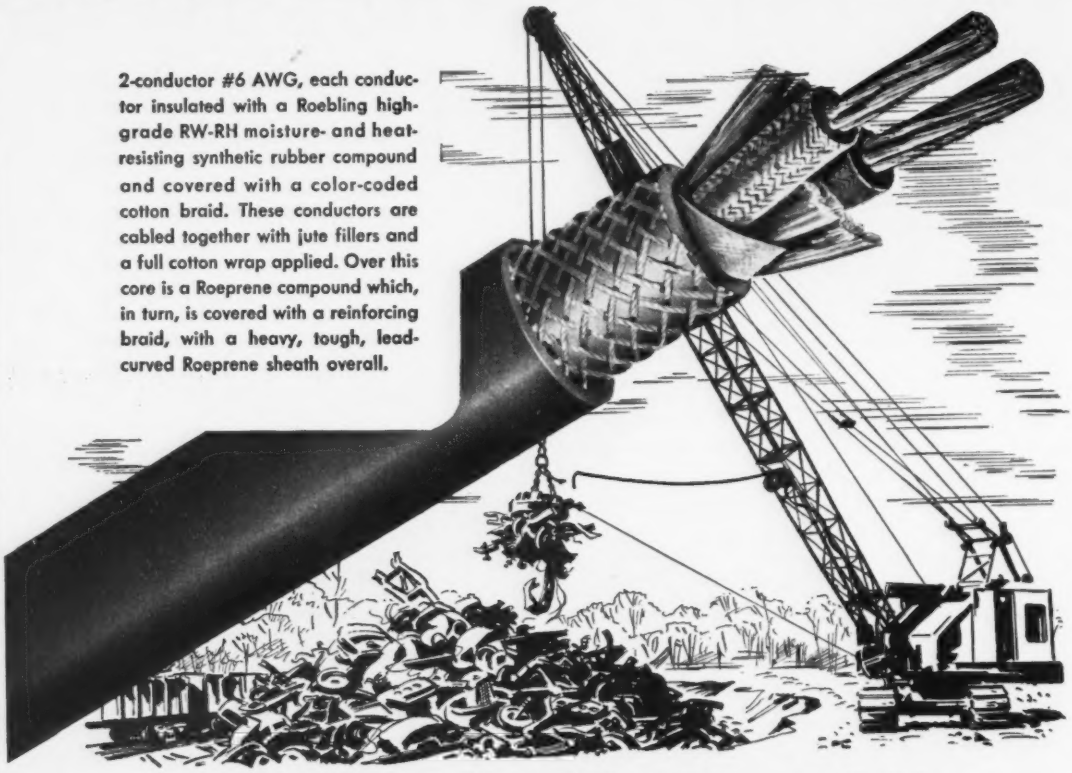
### *Extensive tests in the lab and field*

Like all Westinghouse products going into critical service, the VLB has undergone exhaustive testing in the laboratory and in the field. The 115-kv switch was set up with 70 kv across the contacts (the value encountered in 115-kv service). Under these conditions, it successfully interrupted 600 amperes at 50% power factor for 230 operations. The same switch then interrupted 56 amperes of static capacitor current 100 times and was in good working order at the conclusion of the test. Another unit interrupted 90 amperes of capacitor current on a 34.5-kv system a total of 2020 times.

Units have been extensively tested and are now in service on the Niagara Mohawk Power Corp. system. For more information on VLB switches write: Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pennsylvania.

# ROECLAD PORTABLE POWER CABLES

2-conductor #6 AWG, each conductor insulated with a Roebling high-grade RW-RH moisture- and heat-resisting synthetic rubber compound and covered with a color-coded cotton braid. These conductors are cabled together with jute fillers and a full cotton wrap applied. Over this core is a Roeprene compound which, in turn, is covered with a reinforcing braid, with a heavy, tough, lead-curved Roeprene sheath overall.



## *Roebling Roeclad Lifting Magnet Cables outlast all others 2 to 1*

Roebling Roeclad Lifting Magnet Cable is engineered and produced to withstand rough treatment and to give long service life. The design of this cable is based on field experience of more than 30 years.

Exhaustive tests performed in Roebling laboratories to prove the superiority of Roeclad Lifting Magnet Cables included fatigue and impact tests of representative samples.

In a fatigue test, cable samples after being subjected to more than 2,000,000 reversals—half at room temperature and half at 0°F.—showed no damage to either of the two conductors.

In impact tests, it required over 3000 blows of a 20-lb. weight dropped 5½ inches, 25 times per minute, to cause failure of a two-conductor #8 AWG Roeclad Lifting Magnet Cable.

And a report from an engineering company which has a large number of machines equipped with magnets is typical of the entire field... that Roeclad Lifting Magnet Cable out-performs competitive cables by at least 2 to 1.

Through unending research and development, Roebling's complete electrical line is constantly being improved. You can always buy Roebling with assurance of top efficiency and economy. John A. Roebling's Sons Corporation, Trenton 2, N. J.

*Subsidiary of The Colorado Fuel and Iron Corporation*

**ROEBLING**

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST & 5 PITTSBURGH ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST & 120 S. HEWITT ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • PITTSBURGH, 1301 CLARK BLDG • ROCHESTER, 1 FLINT ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, NEW JERSEY

# NEWS ABOUT PEOPLE

WARREN C. DRUMMOND NOAH C. PEARCY HENRY L. HOEPPNER

## Warren Drummond Promoted

**Pioneer Service elevates veteran employee to vice president in charge of engineering. Three others advanced**

Warren C. Drummond, formerly vice president and chief engineer for Pioneer Service & Engineering Co, Chicago, has been named vice president in charge of engineering to succeed E. D. Uhlendorf as active head of engineering activities.

Uhlendorf, senior vice president, who has been in charge of engineering for the past 26 years, has been made vice president and consultant.

**Appointed Chief Engineer . . .** Noah C. Pearcy, chief electrical engineer, will succeed Drummond as chief engineer and Henry L. Hoeppner, formerly senior electrical engineer, becomes chief electrical engineer.

Amasa C. Bull, vice president, has retired as head of the purchasing section to take up special assignments. Eugene V. Cullen assumes Bull's duties as chief purchasing engineer. Pioneer is currently engaged in work under a contract with the Atomic Energy Commission and Bull will be closely associated with this project.

Drummond, a mechanical engineering graduate of Montana State College, became affiliated with Pioneer in 1925. Pearcy, who was graduated from Purdue University in 1922 with a degree in electrical engineering, was employed by Louisville Gas & Electric Co for five years before going to Pioneer in 1929.

Hoeppner, who received an electrical engineering degree from Tri-State College in 1917, joined Pioneer's organization four years later after having worked for General Electric Co.

Prior to joining the purchasing staff of Pioneer in 1927, Cullen was associated with Oklahoma Gas & Electric Co.

•

**Richard H. Syring** has been named assistant to the secretary of Pacific Power & Light Co. His work will involve preparation of reports and data for specialized needs of financial institutions and stockholders. Before this appointment, Syring was chief of the Pacific Northwest bureau for the Wall Street Journal for eight years.

**Donald B. Vail** has been elected assistant vice president of Commonwealth Services, Inc, New York. He joined Commonwealth in 1950.

**W. H. Jeffery** has been elevated from general manager to vice president and general manager of Philco Corp of Canada, Ltd, Toronto. He has been associated with the Canadian corporation since 1945.

**Lemore W. Clark,** head of Detroit Edison Co's underground lines department since 1949, has been appointed assistant manager of operations. **Frank C. Marschner,** who joined the utility in 1920, succeeds Clark as general superintendent of the underground lines department. **John Jamieson,** assistant treasurer for the past four years, will head the new stock transfer and records department, which combines functions previously performed by two separate departments.

**George H. McBride,** sales manager of Westinghouse Electric Corp's Gearing Division since 1942, has been appointed assistant division manager of the company's Switchgear Division, East Pittsburgh. He joined Westinghouse in 1922.

**Arthur E. Bayley** has been appointed treasurer and **Canute R. Olsen** manager of the general sales staff of United States Steel Supply Division of U. S. Steel Corp. Bayley, formerly assistant treasurer in the Warehousing Division's general office in Chicago, succeeds Frederick C. Touteberg, deceased. Olsen, who has been acting general sales staff manager since May 1, replaces **Harold A. Miller,** who has resigned.

RICKLEF A. REID

## Ricklef Reid Elevated by Montana Power Co

Ricklef A. Reid, assistant superintendent of generation for Montana Power Co, has been promoted to superintendent of that department. He succeeds Everett A. Hamilton who retired recently.

Reid, who graduated from Lehigh University with an electrical engineering degree, started working for Montana Power in 1920 at its Rainbow generating plant at Great Falls. After serving in various capacities at Rainbow, he was named superintendent of Great Falls generating plants and transmission lines in 1943.

He was transferred to Polson as foreman of the Kerr hydroelectric plant in April, 1950, and in November of that year, became assistant general superintendent of generation with headquarters in Butte.

## Utility Board Appointed To Run Tacoma City Light

A five-member public utilities board has been appointed at Tacoma, Wash., to supervise City Light and other municipal utilities under a new city charter. The appointment was made by Mayor Harold M. Tollefson, with confirmation by the City Council.

The board is composed of Gerrit VanderEnde, president of Pacific First Federal Savings & Loan Association; Tom Anderson, co-founder of the Concrete Engineering Co; Joseph L. Long, Jr, executive of the Atlas Foundry Co; C. Morrison Johnson, president of Washington Steel Products Co; and Ralph Johnstone, owner, Tacoma Feed Co.

The board has retained as acting director of utilities C. A. Erdahl, who served as public utilities commissioner under Tacoma's former type of government.

•

**Basil J. Boritzki** has been appointed secretary of the Ohio Public Utilities Commission. Boritzki has served as an attorney-examiner for the commission since October, 1952.

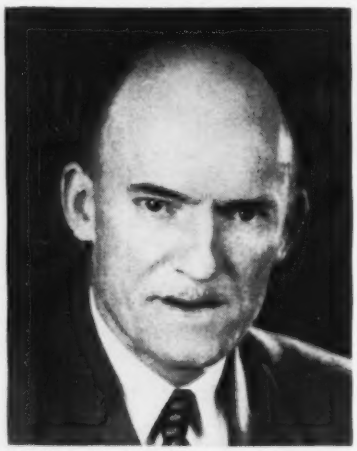
**Olan Ray Thomas** has been made advertising and sales promotion manager of Continental-Diamond Fibre Co, Newark, Del. He joined the company in 1941.

**Ferdinand D. Saunders** has been named a special representative for public utilities by International Business Machines Corp. Saunders, formerly a sales representative in the firm's Brooklyn (N. Y.) office, will handle planning of IBM equipment applications to meet the accounting needs of public utilities.

**W. Rowe Williams,** who has served as general superintendent of the Minot (N. D.) Division of Northern States Power Co, Minneapolis, Minn., since 1935, has been named manager of that division. Williams began with the company in 1926.

# Stephens Named President . . .

**. . . of Winnepeg Electric. Utility also appoints D. P. Martell comptroller and treasurer. Four made division managers**



DONALD M. STEPHENS

Acquisition by Manitoba Hydro-Electric Board of common shares of Winnipeg Electric Co has resulted in several changes in the executive staff of Winnipeg Electric.

Donald M. Stephens, chairman and general manager of Manitoba Hydro-Electric since 1951, was made president and general manager to succeed W. H. Carter, who severed his connection with Winnipeg Electric last February.

**Appointed to Financial Posts . . .** D. P. Martell, formerly assistant comptroller, was named comptroller and treasurer to replace C. H. Lidster, who has retired. Other retirements include: E. V. Caton, former vice president and chief engineer and recently assistant general manager and chief engineer; S. N. Currie, secretary; and I. A. Mahon, sales and merchandising manager. Caton will continue in the capacity of special consultant to the management.

The utility also announced the following appointments: L. M. Hovey was appointed manager of the System Engineering and Planning Division and will have A. S. Williams as his assistant. C. P. Haltalin was named manager of the Operating Division and serving as his assistant will be A. L. Oddleifsson.

J. R. Rettie was appointed manager of the Surveys and Construction Division and H. C. G. Ligertwood becomes Rettie's assistant in the division. G. S. G. Henson was named manager of the Property and Supply Division and T. W. Birt manager of the contract department. D. S. G. Ross was designated economic studies and cost engineer.

## OBITUARY

### George W. Bacon

George Wood Bacon, 84, retired chairman of the board of Ford, Bacon & Davis, Inc, New York engineers, died at Pasadena, Calif., July 21.

Bacon, who was graduated from Cornell University in 1892 as a mechanical engineer, was one of the founders of the New York engineering firm in 1894. During his career with Ford, Bacon & Davis, he had charge of many of the firm's important projects. In 1946 he retired from the post of chairman of the board of directors, which he held for 18 years.

He also was for a time president of the Sierra & San Francisco Power Co, which was absorbed by Pacific Gas & Electric Co.

**J. Warren Marshall,** 72, president of National Vulcanized Fibre Co, died recently at Wilmington, Del.

**Alonzo Ensor Dickson,** 76, former assistant secretary and assistant comptroller of Virginia Electric & Power Co, died July 18 at Norfolk, Va. Dickson joined Vepco in 1908 and remained with the utility until his retirement in 1946.

**James Bryan Noe,** 77, retired assistant to the planning engineer of Consolidated Edison Co of New York, Inc, died July 8 at West End, N. J. Noe retired from the utility in 1941 after serving 43 years.

**F. Maurice Beaubien,** 63, office manager of the Nova Scotia Power Commission, Halifax, N. S., died there June 30. Beaubien was appointed to the commission in 1949.

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# Several Firsts for Detroit Mark New St. Clair Plant

**Unit design and cross-compound turbines are among innovations. Fans, collectors and stacks at ground level reduce structure stresses and costs. Design is based on new plant study of 20 different designs.**

CONDENSING WATER IS PUMPED from river-edge screen

**H. A. WAGNER,** Assistant Chief Engineer

**W. W. BROWN,** Chief Mechanical Engineer, Engineering Department, The Detroit Edison Company, Detroit

Several features of the St. Clair plant are new to the Detroit Edison Company. These include:

**1.** Combination pump and screen house built at the water's edge. This is the first time this Company has combined them in a single structure so close to the water.

**2.** Steel and concrete tubes will be used for intake and discharge channels at St. Clair in preference to open canals because they cost less.

**3.** Stacks are to be at ground level instead of on top of the boiler house.

**4.** Induced- and forced-draft fans, and dust collectors will be at ground level instead atop the boiler house for easier maintenance. Less weight on the roof and upper floors permits use of lighter steel in the boiler house.

**5.** Unit design with one boiler per turbine generator is also new to Detroit Edison.

**6.** Some feedwater heaters are located on the upper floor where more space was available than in the usual boiler-room location.

**7.** Cross compound turbine generator units are being used for the first time on the system.

**Economic Study . . .** An economic study made in 1949 indicated that it would be feasible to replace 70 Mw of old capacity at Marysville Plant with two new turbine generators, which would add 110 Mw capacity to the system in 1952. But with Korea, revised load estimates disclosed that two units of 100 Mw capacity or more each would be required in 1952 and that the old equipment should be retained for peaking.

A new study was made which included economic comparisons of various throttle conditions and boiler-turbine arrangements for twenty different new plant designs. An annual cost summary was prepared for each plan. Items included were fixed charges, coal costs, and labor costs. Then a more detailed study was made of six of the original plans. These included 1,800 rpm straight-through machines, 3,600 rpm straight-through units and 3,600/1,800 rpm reheat machines. During these studies it was found that the battery boiler system was uneconomical, and the larger machines had a distinct fixed charge advantage. At this stage of the comparison the initial throttle conditions were all either 1,450 psi, 1,000 F, or 1,800 psi-1,000 F.

Next, a more careful study was made of reheat. A cost comparison was made of three different plans, two of which were reheat, and a decision was reached to install two cross-compound reheat units. The unit-boiler-turbine arrangement was selected and throttle conditions will be 1,800 psi-1,000F-1,000F reheat. Turbine generators will be the 3,600/1,800 rpm cross-compound double-flow type and have a nameplate capacity of 125,000 kw and a guaranteed capability of 156,250 kw at 15 psi.

**Feedwater Heating Cycle . . .** Numerous heat balance calculations were completed using different cycles and extraction pressures. Six stages of feedwater heating were chosen for economy and ease of operation. Boiler feed pumps will be driven through variable speed hydraulic couplings which regulate the pump output.

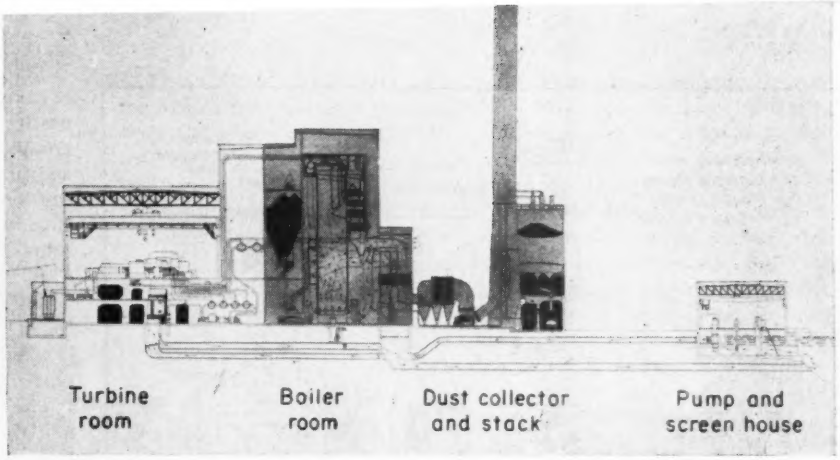
**Turbines . . .** The load split on each unit will be approximately 35 Mw on the high-pressure and 90 Mw on the intermediate and low-pressure turbines at nominal rating. The high-pressure turbine is designed for initial steam conditions of 1,800 psig and 1,000 F and is direct connected to a 3,600 rpm hydrogen cooled generator. The intermediate and low-pressure turbines in tandem are designed for steam reheated to 1,000 F and are direct connected to an 1,800 rpm hydrogen cooled generator. Units are designed for 1.0 in. Hg back pressure absolute.

The high-pressure turbine will exhaust to the resuperheater at 480 psig at 156 Mw total output. The intermediate turbine, to which the steam will be returned at 1,000 F from the reheat boiler, will exhaust through a crossover to the double flow low-pressure element thence to the condenser.

Condensing equipment for each unit will consist of a 76,000 sq ft horizontal single-pass condenser, supplied by two vertical circulating pumps located in the screen houses.

**Canals and Circulating Water . . .** St. Clair will have two screen houses located at the river's edge. Circulating water from each main unit condenser will discharge to an individual closed overflow canal under the basement floor. These canals extend back through the plant and discharge into the main overflow canal, which runs the length of the main building under the first floor of the boiler house.

house through steel and concrete pipes to condensers and back




FOUR 125,000-KW UNITS constitute initial construction program for St. Clair. Each will comprise one boiler, one cross-compound turbine-generator and one stack

**Boilers and Auxiliaries . . .** Each boiler capable of delivering 1,070,000 lb of steam per hour continuously. The unit, designed for 2,050 psi, will operate at a superheater discharge pressure of 1,850 psi. Steam will leave the superheater at 1,000 F. temperature. The reheater will raise 954,000 lb of steam per hour from 682F to 1,000F.

The completely water-cooled furnace, divided midway from each side by a water tube division wall, has been designed for horizontal firing of either pulverized coal or oil and for the removal of dry ash from the two hoppers below the furnace itself.

Combustion air, supplied by two forced draft fans, will be heated from 80F to 578F. Combustion gases will leave the furnace at 2,020 F through 3-inch OD screen tubes spaced on 12 in. centers then pass over the 2 in. OD tube pendant type secondary superheater. Gas and steam flow will be parallel. Hydraulic couplings will be used for induced draft and forced draft fan speed variation.

Temperature of gases to the stack will be 267F corrected for heater air leakage. The entire gas-tight boiler unit up to the economizer outlet will be top supported and expand downward, requiring seals only at the ash discharge hopper where it connects to the ash removal equipment.

Flue gas recirculation will provide for maintaining design main steam and reheater steam conditions down to will be a single-drum radiant-type half boiler capacity. Gas recirculation raises both main steam and reheater steam temperature. Since the curve of temperature vs load for the two have different slopes, a compensating control has been provided.

Soot blowing is by an automatic sequential system. The control board is located in the central control room. Air is supplied at 250 psi at the blowers.

Furnace bottom ash collects in two-water-cooled basket type furnace hoppers and is periodically dumped by the operation of ash gates into dry ash hoppers. Dust collector efficiency is expected to be 97.5%.

**Operation . . .** Centralized control was selected because with it a minimum operating complement would be required. A mechanical control room will be provided for each two units, a total of two rooms for the four-unit plant. Since the electrical control system involves not only turbine-boiler unit electrical services but also general plant services and 120-kv switching station control, electrical operation is divorced from mechanical operation. There will be one centrally-located electrical control room.

All phases of operation of turbines, boilers, boiler feed pumps and other essential auxiliaries will be handled in the mechanical control room. Normally, operation will be automatically controlled by pneumatic equipment with provision for remote control from the control room.

Normal starting operations will take place at the equipment except for the items which must be started during normal operating periods. This equipment includes boiler feed pumps, recirculating gas fans, mills, and control valve by-passes. All normal or emergency shut down operations are centered in the control room.

**Coal Handling . . .** Coal will be delivered to the plant by self-unloading boats of from 5,000 to 10,000-ton capacity. Normally the year's supply of coal will be received during the navigation period, 1 to 1½ million tons being stored for consumption from December 15 to April 15, when navigation is closed, plus an amount sufficient for about 50 days beyond.

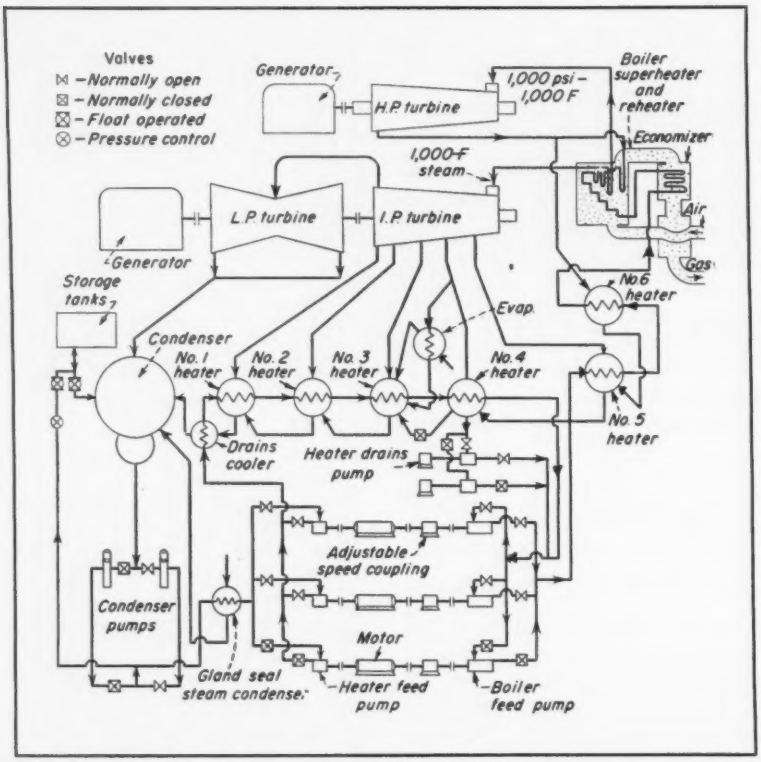
Coal handling will be by rubber belt conveyor system of nearly 12,000 feet of belting on a total of 27 conveyors. It will be a single belt system throughout.

**Turbine Generators . . .** Generators driven by the high-pressure turbines will be at 0.8 pf and 0.5 psig hydrogen, and designed for higher ratings at higher hydrogen pressures up to 30 psig. Generators driven by the intermediate pressure and low-pressure turbines are 1,800 rpm, 15,500v, 100,000 kw at 0.8 pf and 0.5 psig hydrogen, and are also designed for higher ratings at higher hydrogen pressures up to 30 psig.

The two generators of a unit will be solidly-connected together at their terminals by metal enclosed, isolated-phase, copper tubular bus. These generator buses will be indoors, below the generators and near the outside turbine room wall. They will connect to the generator transformers outdoors by two-metal enclosed isolated-phase copper tubular buses per phase.

Neutrals of the 3,600 rpm generators will be isolated or floating. Neutrals of the 1,800 rpm generators will each be connected to ground through a 37½ kva 13,800-240v, single phase, sealed-dry type distribution transformer.

**Excitation . . .** Each generator will have its own 1,800 rpm stabilized ex-




**SIX STAGE FEED-WATER HEATING** was selected after numerous calculations. Turbine seal steam also is recovered. System uses closed-type heaters, some of which are above the usual boiler room location to conserve space. Boiler feed is regulated by hydraulic coupling

citer without pilot exciter. Those on the 3,600 rpm generators will be driven through reduction gears from flexible couplings on the shafts, while those on the 1,800 rpm generators are driven direct from flexible couplings.

There will be two motor-driven exciter sets for starting the units, and for emergency use. They will be 400 kw, 250v, 1,200 rpm stabilized exciters without pilot exciters. The switching arrangement will be such that any motor driven exciter can be connected to the field of any 3,600 rpm or 1,800 rpm generator.

**Relay Protection . . .** Each phase of each generator will be protected by sensitive current differential protection from current transformers on the neutral terminal bushings to current transformers on the high-voltage terminal bushings.

The zone from the neutral current transformers on the generators to those on the bus side of the 120-kv oil circuit breaker, including the high voltage bushings on the 6,500 kva terminal auxiliary transformers, will be protected by ratio differential current protection and instantaneous high current differential protection. The 6,500 kva auxiliary transformers will also be individually protected by ratio differential current protection and instantaneous high current protection from their high voltage terminals to their 2,400-v buses.

Generators are to be tripped for ground faults by sensitive voltage and current relays on the resistance loaded secondary of the neutral grounding transformer.

**Transformers . . .** There will be one 190,000-kva, 3-phase, outdoor 15-kv delta to 138-kv wye transformer for each unit with taps at 135, 132, 129 and 126 kv. Each transformer will be directly outside the turbine house wall from its associated turbine generators.

There will be two generator terminal auxiliary transformers for each unit. They will be 6,500 kva, three phase, oil-insulated-self-cooled outdoor type, 15.5 kv delta to 2.4 kv grounded-wye with 2-2½% taps above and 2-2½% taps below.

**Essential Auxiliaries . . .** Auxiliaries directly necessary for the operation of a plant unit will be divided as nearly as possible into two equal groups, each served by a 2,400-v bus and its associated metal clad air circuit breakers. Motors 200 hp and larger will be served at 2,400 v. Those below 200 hp will be served at 480 v. Each 2,400-v essential bus will feed a 480-v essential bus and its associated metal-enclosed air circuit breakers through a 750-kva sealed dry type transformer.

The two 480-v essential buses of a unit will have ties, one to the other. One will be automatically thrown to the other on the opening of either 2,400-v breaker on its 750-kva transformer. The 480-v tie breakers and transformer breakers will be interlocked so that the two 750-kva, transformers of a group cannot be tied together.

Service for the plant and for those loads not directly associated with the continuous performance of any one unit will be supplied from five 2,400-v system service buses.

No oil filled circuit breakers or transformers will be within the plant proper. All transformers 2,400-480-v will be three-phase, sealed dry type, and all lighting transformers 480-208/120v will be three-phase open ventilated dry type. The only liquid filled transformers inside the plant proper will be the Pyranol-filled potential transformers on the generator terminals.

**120-kv Switching Station . . .** The 120-kv switching station will take the generated output from the plant and feed it into the transmission system by means of a flexible bus and line arrangement.

The station is laid out with provisions for six generator positions and twelve lines. These will be arranged in such a way that the station may be divided into either two bulk power areas with three generators and six lines per area or three areas with two generators and four lines per area. The area buses in this ultimate scheme will be connected through reactors in series with regulating transformers to form a ring for maximum flexibility during bus shutdowns either routine or emergency.

The present installation provides for four generators and eight lines, with two lines and one generator separated from the rest of the station by means of a reactor. This generator will have throwover facilities.

## APPA Study . . .

### . . . compares operating statistics of publicity and privately owned electric utilities

American Public Power Association has released a study entitled "More Power at Lower Cost" which compares the operating statistics of the nation's publicly and privately owned electric utilities.

Electric companies can produce energy cheaper than publicly owned systems, but the locally owned public utilities can sell it cheaper, according to the APPA report. The report lists as reasons for this the fact that expenses for distribution and transmission, accounting and collection, and promotion and advertising are less for publicly owned utilities than for private utilities while production expenses are only slightly higher. (See Table 1.)

Also, the report says, publicly owned utilities have a tax expense to operating revenue of 2.5% while for private companies the ratio is 21.8%.

**FPC Figues Used . . .** Figures used in the APPA study are those reported in Federal Power Commission publications for 1951 for Class A and B utilities.

The study also points out that average residential customer of a publicly owned utility uses 43.7% more power per year than the customer of an electric company and at the same time has an electric bill 5.5% smaller. (See Table II.)

**Table I**

**Comparison of Expense Items Class A and B Utilities 1951**

| | Electric Companies | Publicly Owned Systems |
|---|---|---|
| Production Expenses per kwhr sold (mills) | 4.87 | 4.92 |
| Transmission Expenses per kwhr sold (mills) | .26 | .13 |
| Distribution Expenses per customer (dollars) | 12.46 | 12.14 |
| Accounting and Collection per customer (dollars) | 4.61 | 3.45 |
| Promotion and Advertising per $100 revenue (dollars) | 1.64 | .95 |
| Administrative and General per $100 revenue (dollars) | 6.40 | 6.40 |

**Table II**

**Kwhr Sales: Residential Customers 1951**

| | Electric Companies | Publicly Owned Systems |
|---|---|---|
| Average number of kwhr sold per customer | 1,910 | 2,745 |
| Average annual bill per customer (dollars) | 55.23 | 55.21 |
| Average revenue per customer (dollars) | 2.89 | 1.90 |

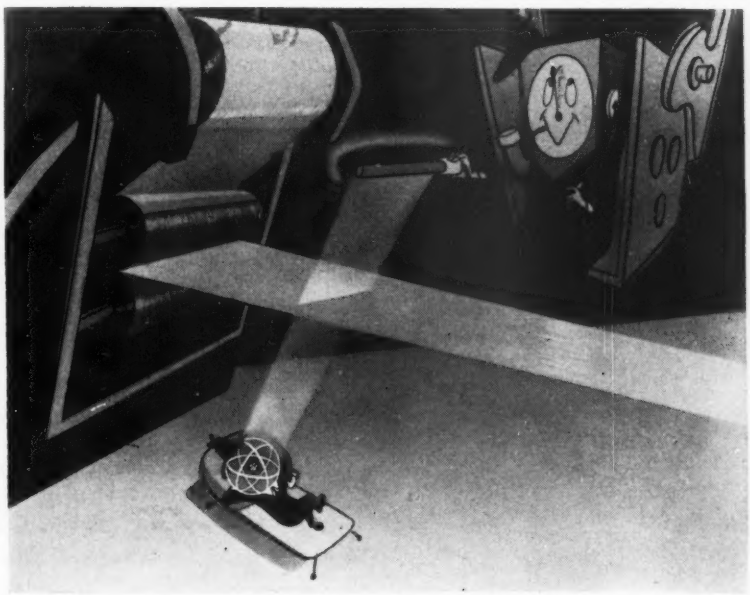
## Electrical Work Mishaps in California Show Rise

Fatal injuries connected with electrical installations and equipment in places of employment in California in 1952 rose above past ten years' average, according to California's Department of Industrial Relations. Statistics for year ending Dec. 31, 1952 show total of 909 injuries, including 40 fatalities. Increases were recorded over 1951 report in total number of injuries and deaths from contacting overhead high-voltage lines through equipment.

Approximately 80% of injuries involved unsafe acts by workers, indicating that observance of safe practices would eliminate most electrical work accidents. Breakdown of this percentage shows following approximate figures:

1. Use of unsafe or defective equipment—22%
2. Failure to de-energize equipment before maintenance or repairs were begun—18%
3. Unsafe use of tools—14%
4. Use of equipment in unsafe place—14%
5. Unsafe position—11%.

Statistics were based on analysis of injury reports filed by physicians and surgeons with California Department of Industrial Relations.

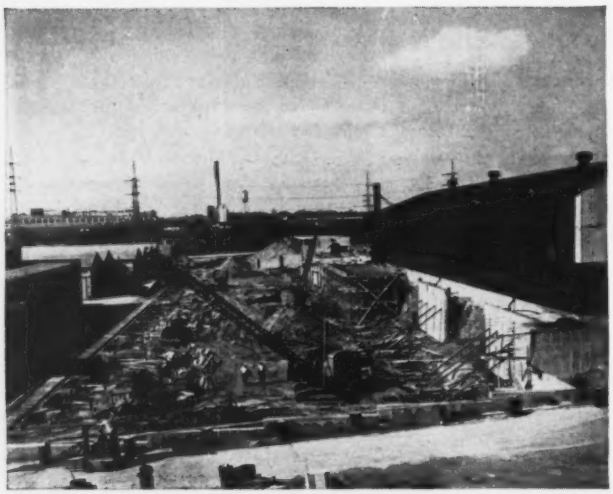


## 'Private Eye-sotopes' in Industry

Scene from "A is for Atom," General Electric Co color film about atomic energy illustrates one application of radioactive elements in industry. Radioactive tracer at bottom, and Geiger counter at top are used to maintain uniform thickness in a sheet of aluminum. The film explains the phenomenon of nuclear fission and highlights the multitude of potential benefits in medicine, industry, agriculture, and other fields.

General Electric is making the movie available to electric utilities and other business and industrial concerns. Companies interested in using the 16-minute film for employee or public showings may obtain it on free loan from film libraries in General Electric district offices, or may purchase a copy at the print cost of $100.

# NOW GET IN ON OF SOME



It may be a little difficult from these excavations and footings to visualize the fine, new building at the right . . . but from this foundation is rising a specialized plant with a 70-foot high crane bay equipped with two 100 ton cranes. This 120 by 530 foot structure will house the necessary facilities to build transformers in any Kva and voltage ratings.

This picture literally lets you in on the "ground floor" of one of the most important expansions in the electric industry; it was taken during the start of construction of Moloney's new plant especially designed and built for the assembly and testing of transformers of Kva capacity to meet the utilities' needs of today and tomorrow.

And you know that this [illegible] picture. The whole Moloney team of engineers and craftsmen have brought into the high Kva field all the skill and care that has built "extra value" into every Moloney Transformer for over fifty years. All this is available to you today!

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MK-53-22

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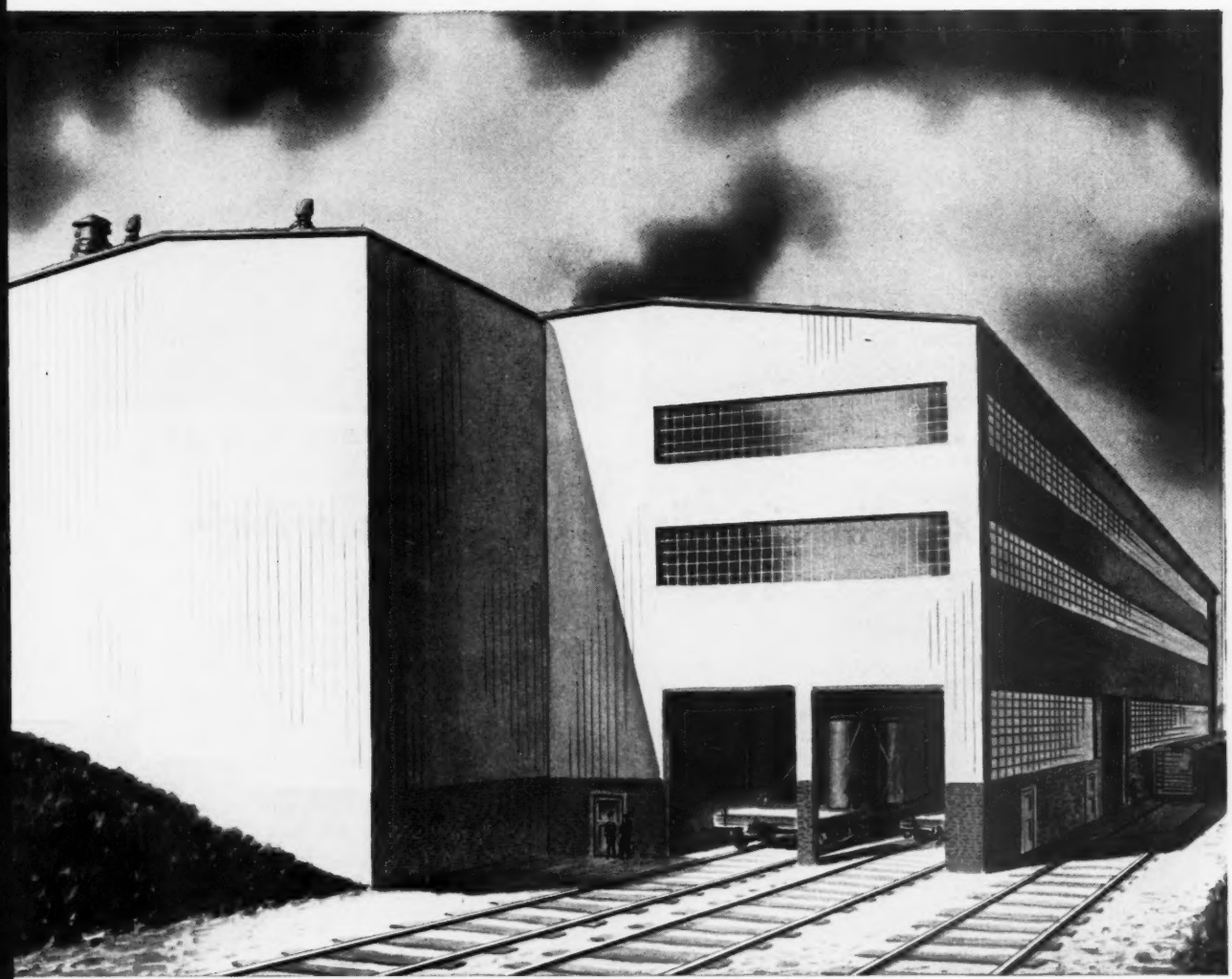
# POWERFUL NEWS!



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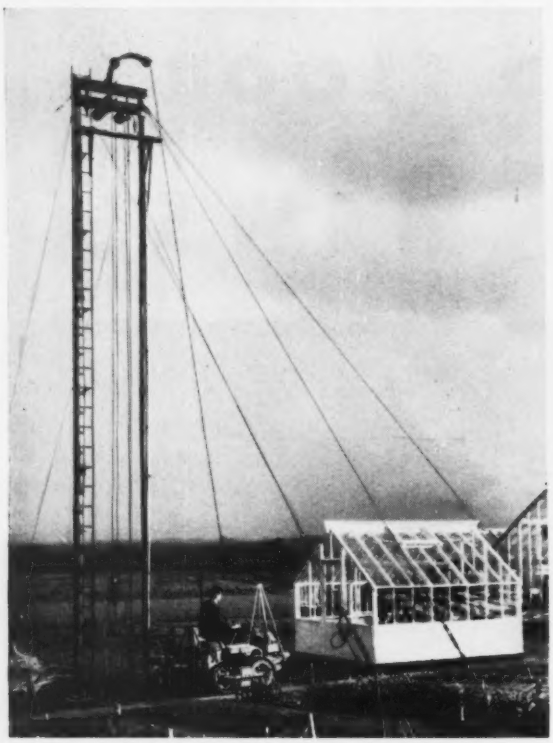


ELECTRIC tractor, with cable handling tower . . .

. . . and an electric weedkiller are included in . . .

# British Experiment with Electric Farm Aids

## Tests by government research group lift food production potential of country's limited rural areas

J. H. M. SYKES

Great Britain, always acutely conscious of the need for greater supplies of home-grown food, has not neglected to apply electrical research to food production and increased efficiency on the farm.

The British Electrical and Allied Industries Research Association (ERA) started a rural electrification section in 1938. The government-sponsored association recently displayed current progress at its field station at Shinfield, Berkshire. Highlights were:

• **Electrical Weedkilling:** Failure of chemical weedkillers to eradicate completely the roots of tough weeds led ERA engineers to devise a 1,200-v d.c. generator, one pole running to a ground spike and the other to an insulated probe with a metal tip. Tip is placed on the weed, resulting in a sizzle which (with one amp of current available) "electrocutes" all parts of root structure as current returns to ground. Though not as yet commercial, the device is undergoing large scale tests on exterminating bracken from heathland.

• **Soil Warming in Open Air:** Bare wires, hitched to 30-v step-down transformer, are buried below plot of ground. No thermostatic control is used. Daily dosage of energy is from 60 to 90 watthours per sq ft per day. Results, compared with unwired neighboring plots, are promising and economical use of electricity to counter near frost conditions at vital early stages of plant growth is anticipated.

• **Flash Illumination of Poultry:** Tests show unexplainedly good results, as compared with regular added daylight conditions. Three sets of identical birds have: (1) ordinary daylight; (2) artificial light to extend working day to 14 hours; (3) two 1,500-w flashes (each 20 sec duration ) at 4 a.m. and 4:45 a.m. each day. Results (as percentage of total possible eggs per bird): (1) 58% (2) 74%; (3) 65%. No diminution in egg weight or in health of birds has been detected in this year-long test. Saving in current consumption with flash illumination is high, justifying its acceptance, since it is only 9% less effective than "added daylight."

**Other Experiments . . .** Other tests have been undertaken with pest extermination and saving heat used in milk cooling. In the extermination work, an experimental high frequency generator kills weevils without overheating the grain itself. Cost of large scale application, with 1,400 lb/hr of grain conveyor-belt-treated, using 25 kw generator, is estimated at 63 cents per ton.

By use of dairy heat pumps, heat wasted in milk cooling is employed

to warm buildings. Experimental model takes in 30 to 40 gal of milk into cooler and reduces heat level so that about 25 gal of ambient temperature water is raised to 130 deg. F. This is with expenditure of no more than 5% more energy than if the milk had been refrigerator-cooled.

ERA has also completed a nationwide survey of wind power prospects, and is developing wind generators which may aid isolated farmsteads to benefit by research work already finished, and other parallel work aimed at providing mechanical standardized and cheap power equipment for all farm purposes.

## Catchy Headline . .

### catches customers for barn cleaning installations by Atlantic City Electric Co

Don't putter in the gutter,
Put a conveyor in there!

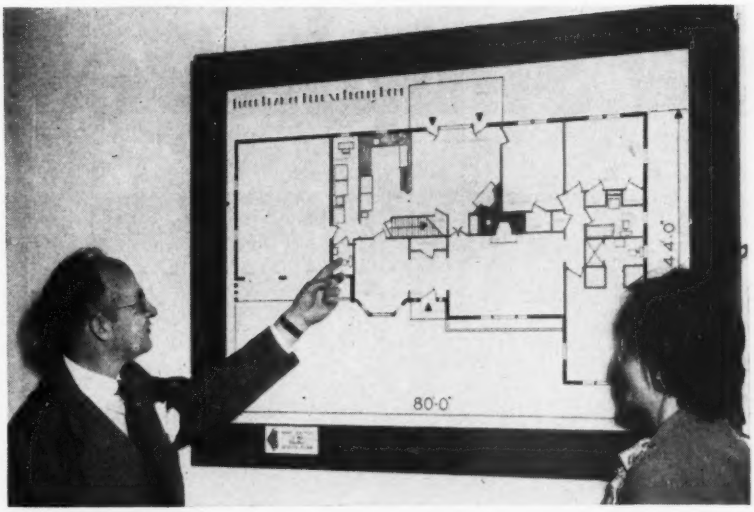
With that headline on its promotional material sent to rural areas Atlantic City Electric Co is offering the assistance of a rural representative to help select and layout an electric barn cleaning installation. The installations are planned by M. O. Withed, rural supervisor, comparing the cost of electric operation with the messy, backaching manual job.

Gutters in a 40-cow barn are cleaned in 15 minutes, a job that can be handled by a 6-year-old-girl. A gutter conveyor with a 3-hp motor and an inclined elevator with a 1-hp motor carries the manure out of the barn and into a spreader. Electric cost averages four cents a day.

Back in the days when the son cleaned the barn manually, time required was an hour-and-a-half. If time is figured at 80 cents per hour while cleaning the barn, cost would be $1.20 per day, or 30 times the electrical cost.

## GE Has New Disposer

A food waste disposer, sized to fit 90% of existing sinks without alteration of drain connections has been announced by General Electric Co's electric sink and cabinet department. The new FA-45 disposer, while two in. shorter than other models in the line, employs the same shredder mechanism and motor.



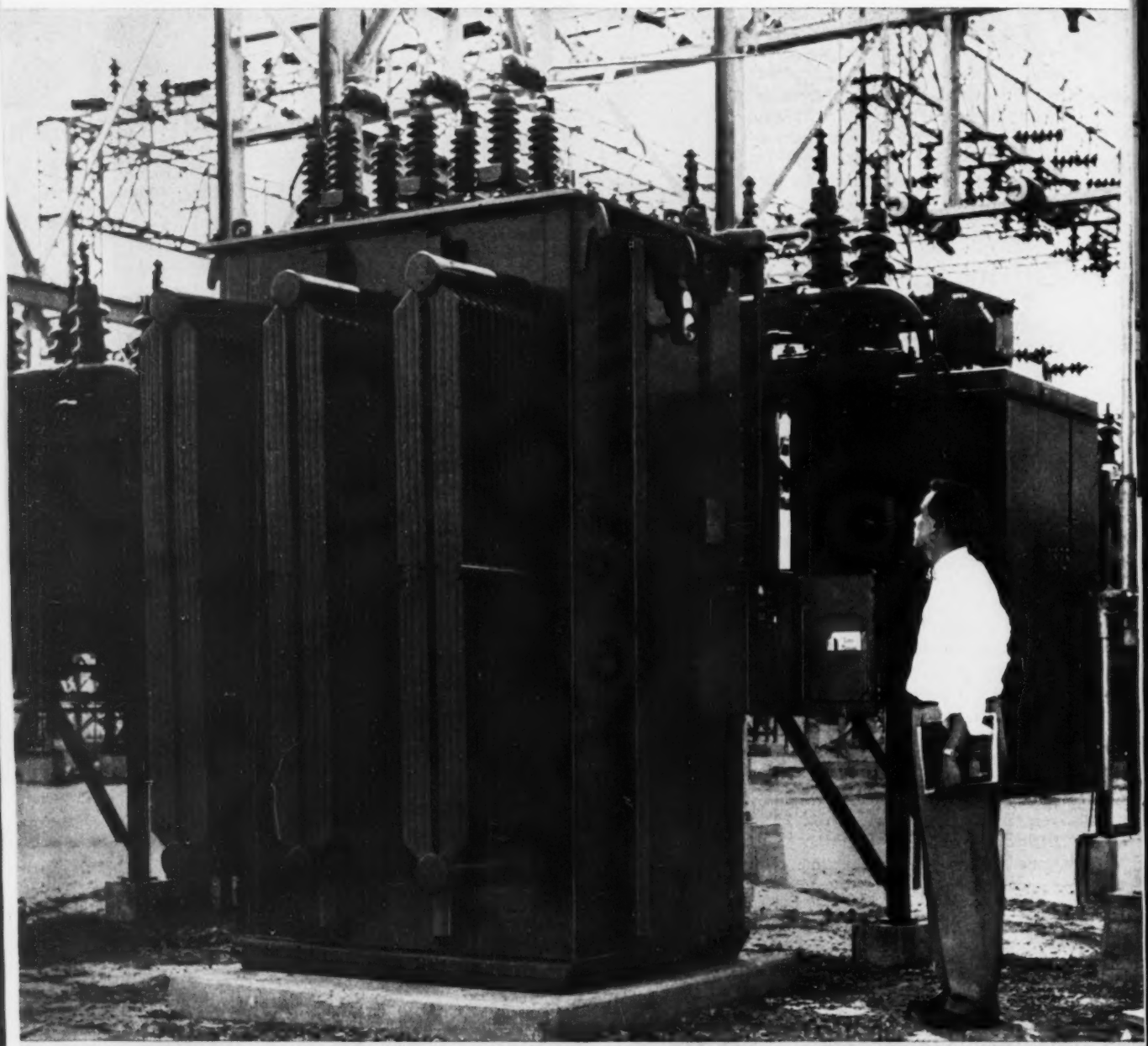

## Demonstrator Outlines Adequate Wiring

A problem usually encountered in model home demonstrations is that of "showing" the adequate wiring system. A demonstrator devised by Westinghouse Better homes Bureau has been successfully used by utilities such as Indianapolis Power & Light Co and the Electric Power Board of Chattanooga. Once visitors are attracted to the floor plan hung on the wall, a representative presses a button. Superimposed on the plan is a complete wiring system in red. Its advantages are explained. The demonstrator is easy to make. It is essentially a "shadow box" with a number of fluorescent tubes. Enlargement or drawing of the plan can be about 5 ft wide. Wiring system can be shown in two ways: (1) drawn in red on back of the plan; or (2) drawn on a separate sheet which is registered with the floor plan. Paper should be translucent enough so the plan will show through clearly when lights are turned on.

## Shadow, Glare Problems Solved

Shadow and glare problems due to several roadway levels were licked through installation of 86 incandescent, 6,000-lumen street lamps and "hidden" floodlight on west approaches to Portland, Ore., Steel Bridge. Luminaires of Type 2 or Type 3, as dictated by road width, are mounted 30 ft above street level. Average separation is 100 to 120 ft, with extremes of 75 and 190 ft. To provide additional illumination in lowest level, a 1,000-lumen flood lamp is recessed in wall to throw light from behind the driver in direction of traffic.

# How Simple Design Cuts



## High Quality Construction

Tap leads from the winding are brazed to bus bars that project through the barrier separating transformer and mechanism compartments. Double bolts secure these bus bars to the dial switch terminals so that neither electrical nor mechanical vibration can work them loose. The barrier supporting the bus bars is well below oil level for maximum dielectric strength.

## *Quick-Break* Mechanism

The *Quick-Break* mechanism is built to withstand severe operating conditions without servicing. All moving parts — even the driving motor — operate under oil. There is nothing to lubricate or adjust. Universal couplings between operating mechanism and dial switches eliminate danger of misalignment. Every nut and bolt is securely locked. 20 years of field experience prove its value.

# Cost of Regulation . . .

★ **Improves Quality**

★ **Provides for Long Life**

★ **Simplifies Maintenance**

THE SIMPLE DESIGN of Allis-Chalmers three-phase power regulators solves the problem of lowering regulation costs. Thanks to simplicity, you get highest quality regulation with an absolute minimum of maintenance. You get ± 1 volt band, Class I accuracy, 20% range of regulation, and many famous Allis-Chalmers features.

### Unit Construction Improves Quality

Unit construction keeps workmanship quality at a high level. All connections are made before the unit is tanked. Thus work is done while parts are readily accessible and easily inspected. Unit construction also permits continuous leads from transformer coils to the double-bolt terminals on the dial switch, eliminating a total of 78 connections required in other designs.

### *Feather-Touch* Control

Simplicity also extends to the control — the famous *Feather-Touch* control feature. This control has fewer operating components than any other regulator control. Operation is easy because control components are calibrated. Voltage band and voltage level can be set in less than a minute.

### Simple, Rugged Tap-Changing Mechanism

The *Quick-Break* tap-changing mechanism is another major reason why Allis-Chalmers three-phase power regulators have built up their excellent operating records over the past twenty years. It provides fast tap changing without shock, since it operates on the balanced spring principle, snubbing fast-moving parts to a quick standstill after a tap change. This field-proved design requires virtually no maintenance.

It pays to investigate all the high quality features of Allis-Chalmers 5/8% step regulator design. For more details, contact the A-C district office nearest you or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4126

# ALLIS-CHALMERS

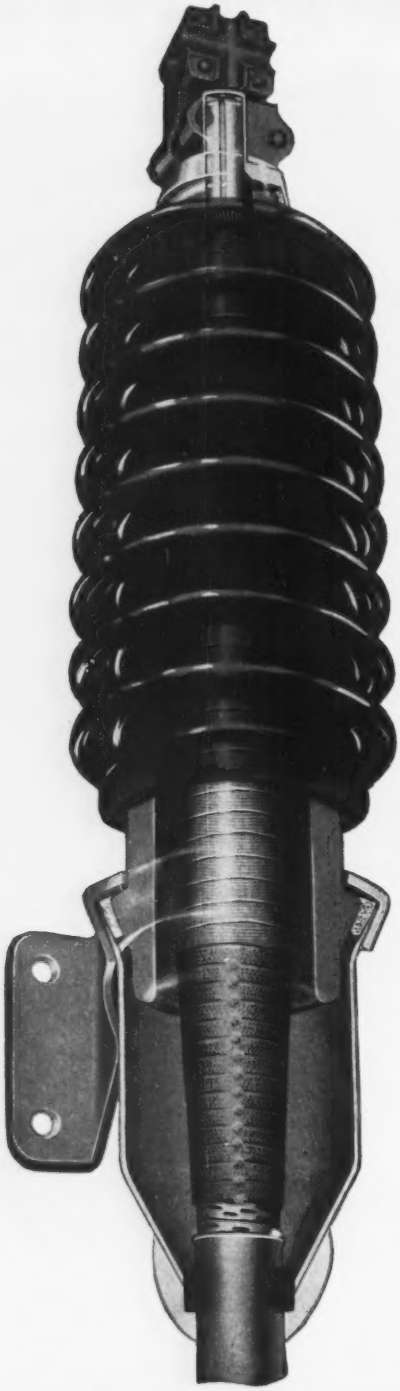
*Originators of 5/8% Step Regulation*

## Long-Life Contacts

**Four factors add to contact life: (1) contacts are large; (2) they are manufactured with arc-resisting material; (3) small 5/8% steps reduce the amount of kva to be interrupted; and (4) fast, clean contact separation provided by the *Quick-Break* tap-changing mechanism snaps the moving contacts from one position to the next before there is time for damage to occur.**

| | |
|---|---|
| **Ratings Available** | Through 2500 Kva<br>Up to and Including<br>69 Kv |

# STRESS RELIEF CONES



*improve the electrical characteristics of high voltage cable terminations*

**Stress relief cones reduce the unit electrical stress in the cable insulation at the end of the grounded sheath. They increase the overall internal dielectric strength and reliability of the cable termination.**

**Stress relief cones are recommended for all shielded cables and particularly for single conductor lead-covered and three-conductor shielded cables operating at 12 Kv. and higher voltages.**

**For compound-filled potheads on paper or varnished cambric insulated cables, a double cone is built up of half-lapped varnished cambric tape. The lower slope is wrapped with copper tinsel braid, tucked under the bell at end of lead sheath and soldered to the lead sheath and/or to the cable shielding tape. *On rubber insulated cables use Nozone rubber tape and TINNED copper tinsel braid.***

**For gas and oil filled potheads, insulating tape is applied OVER the ordinary stress cone to compensate for the absence of solid compound and provide the necessary electrical strength.**

**Specify and order G & W POTHEADS with stress relief cone material in unit package kits. The correct amount of proper tape and shielding braid is supplied in convenient form — clean, dry and ready for use. Varnished cambric tape and coppper tinsel braid is oil packed in sealed cans.**

**G & W furnishes dimensions and instructions for stress relief cone installations, when requested on orders for potheads.**

***Send for Bulletin No. A52 which explains the theory of stress relief cones in potheads, and lists prices of unit kits for cables of various kinds and sizes.***

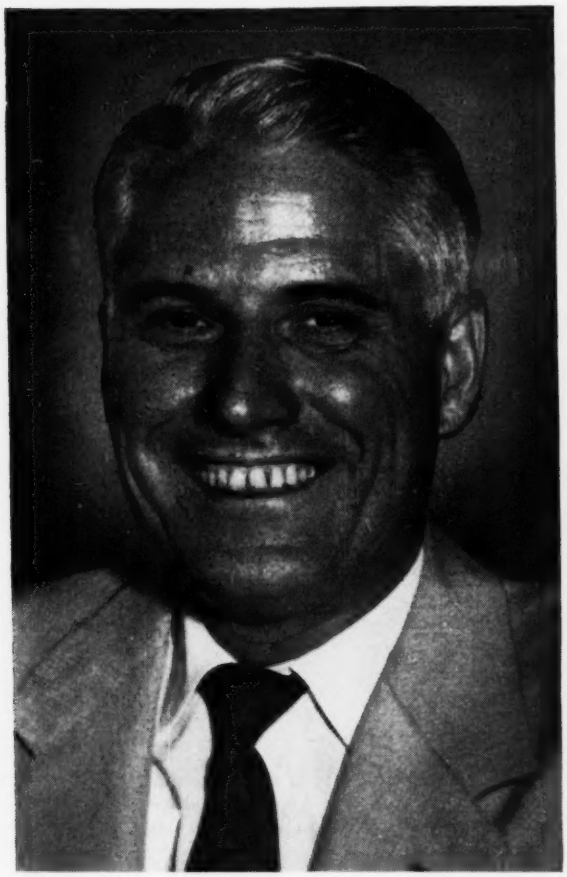
**G & W ELECTRIC SPECIALTY COMPANY**

**7780 DANTE AVENUE • CHICAGO 19, ILLINOIS, U.S.A.**

*Representatives in principal cities. In Canada, Powerlite Devices, Ltd., Toronto*

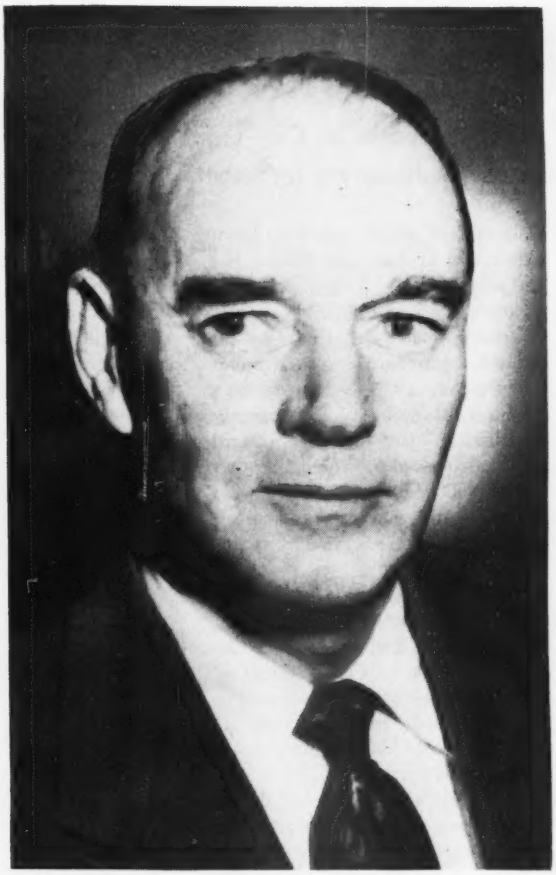
is time for damage to occur.

# INDUSTRIAL RELATIONS



## Farmer Is NLRB Chairman . . .

Guy Farmer, new chairman of the National Labor Relations Board, has had a well-rounded experience as a member of NLRB's legal staff before joining the Washington law office of Steptoe & Johnson in 1945. He later became a partner in the firm. Johnson is Louis Johnson, former Secretary of Defense in the Truman Administration. As a resident of voteless Washington Farmer has not been a member of any political party. The last time he voted was for Wendell L. Willkie, Republican candidate for president in 1940. He is considered a neutral acceptable to both organized labor and Taft Republicans.



## . . . McCoy Is Mediation Head

The new director of the Federal Mediation & Conciliation Service, Whitley P. McCoy, has been a law professor at the University of Alabama for more than 25 years. During this period he has served the government temporarily as a NLRB trial examiner during summer vacations and for a brief period as federal conciliator. He has also served as an arbitrator of particular labor disputes and as a permanent umpire under the labor contracts of many companies, including International Harvester and Goodyear Tire & Rubber. McCoy is a Democrat who backed Eisenhower's election.

## LABOR BRIEFS

**Salt River Power District,** Phoenix, Ariz., has granted wage increases of about 7% to its 500 workers . . . **Average starting salary** for the June engineering graduate of Illinois Institute of Technology reached a record high of $362 a month, according to a survey conducted by Earl C. Kubicek, IIT placement director . . . **Secretary of Labor Martin P. Durkin** will address the First North American Conference on Apprenticeship to be held in San Diego, Aug. 2-9.

**Westinghouse Electric Corp** has granted about 18,000 of its employees not represented by unions wage increases of 3 to 11¢ an hour for hourly paid workers and $5 a month for those clerical salaried employees earning up to and including $210 monthly. Larger increases are granted up the salary scale to a maximum raise of $18.60 a month or 4½%, whichever is greater. Supervisory, administrative, and professional salaried employees receive a 5% increase.

## FINANCIAL

# Tacoma's Building Queried . . .

### . . . by chairman of City Light board, who says $4.5 million cost of headquarters represents 10% of utility's assets

Cost of new $4,503,060 City Light headquarters at Tacoma, Wash., has come in for much critical comment from the city's new utilities board.

Gerrit VanderEnde, chairman of the board, commented that the building represents 10% of the utility's assets, in relation to City Light's financial structure. He and other board members expressed the conviction that "Tacoma will be glad to have that sort of building 25 years from now" but questioned such an investment at this time.

**Tax Increase Rejected . . .** In drawing up the new city charter, a 2½% increase in the tax on City Light gross revenues was rejected because such a $250,000 increase could seriously affect the future of the financial structure of the utility and possibly would have an effect on floating of future revenue bonds, VanderEnde recalled.

"It occurs to me that the interest on the cost of this building, with maintenance and depreciation, will bring the cost of carrying them awfully close to $250,000," commented the chairman.

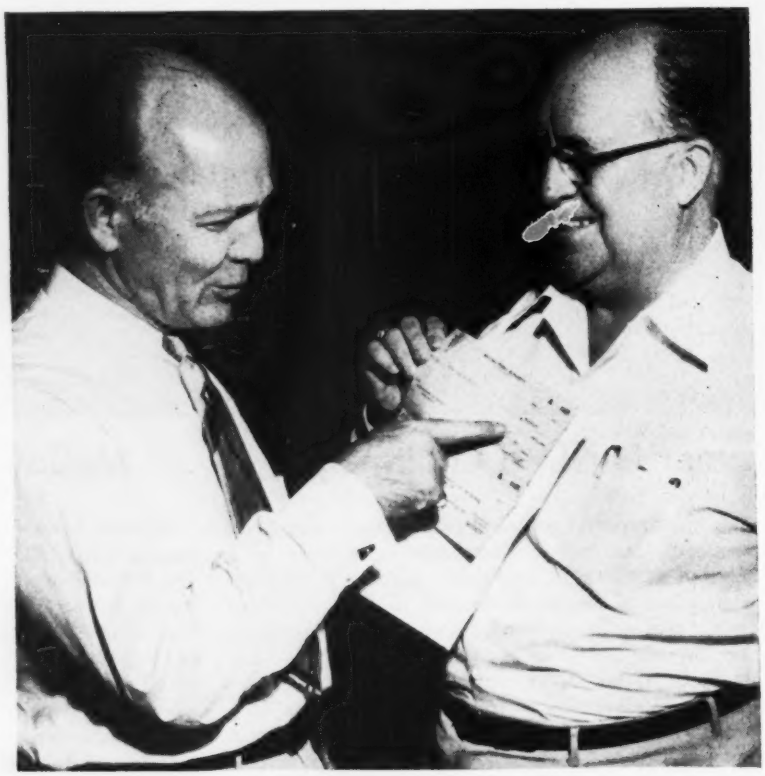
C. A. Erdahl, acting utilities director, countered board comments by declaring that "the proof of the pudding" will be the increased efficiency of the operation in meeting the people's demands for power. He expressed the opinion it wasn't the capital outlay that "breaks the back" but cost of maintenance and operation of such a project.

**Closer Look . . .** Figures presented by Erdahl showing the department plans eventually to spend $5,044,421 in additional facilities prompted VanderEnde to comment that the board would "stress a close look at the remainder of the work and money necessary to carry it."

First unit of the $4,503,060 headquarters—an administration building for which a $1,204,000 contract was awarded last fall—is nearly ready for occupancy. It is a 4-story, 100x300-ft building with 133,600 sq ft of floor area, including office and working space, auditorium, cafeteria and kitchen, first aid and dispensary room, model kitchen and home economics department, and public reception room. Features include a reverse cycle heating and cooling system, using heat from the water of two wells located near the building.

## REGULATION

**Florida Power Corp** has received approval from the Florida Railroad and Public Utilities Commission to increase rates $1,265,000 a year effective Aug. 1. The rate of return will be 6.45% based on 1952 operations.



# Arizona Power Agency Pays Up

The Arizona Power Authority Commission plans to get out of hock in a hurry.

Nine years ahead of schedule, the commission made an $83,622 payment to the state on appropriated loans totaling $250,000 advanced to get the agency started.

A. E. Thomas, commission chairman, is presenting the check to Gov. Howard Pyle representing $50,000 on the principal and $33,622 on all interest accrued to date.

The commission is a self-supporting agency set up to distribute Arizona's share of Colorado River energy to power users of the state. It operates solely on revenue derived from its sale of power and receives no state appropriations as do other Arizona agencies.

## Rate Hike Cited . . .

### . . . of 8½% to about 12% at Washington State PSC hearing on WWP-Puget merger

Although a firm of consulting engineers reported that advantages resulting from a merger of Puget Sound Power & Light Co with Washington Water Power Co would more than offset disadvantages, some evidence was submitted to the Washington State Public Service Commission indicating that the merger might lead to rate increases (EW, July 27, p 107).

"The factors which affect the proposed consolidation adversely are limited in number, whereas the advantages flowing from the merger are numerous, and those which have been investigated will provide economies more than sufficient to offset the added costs which derive from the adverse factors," reported the New York engineering firm of Ford, Bacon & Davis, which had been retained by the commission last April to make an independent study of the possible effects of a merger on the two firms.

**Possible Rate Hike . . .** The matter of a possible rate increase was brought up by Dr Lionel W. Thatcher, professor of public utilities and transportation at the University of Wisconsin; Fred Kleinman, chief of accounts and finance for the Illinois Commerce Commission, and Professor Arthur M. Cannon of the University of Washington. All agreed that it was questionable whether WWP could maintain its present earnings and dividends after the merger without increased rates, although admitting that any actual effect the merger would have on rates would be impossible to determine until the final terms of the merger are completed.

Cannon indicated rate increases of 8½% to about 12% might be necessary if the merged company were to maintain a sound capital structure.

"The capital structure of the merged company would be unsafe if any large group of Puget stockholders were to ask for cash instead of trading their stock for stock in the merged company," said Cannon. "On the other hand, it is unrealistic to think that any large number of Puget stockholders will pass up cash at $27 a share, as the indicated value of the new stock will be about $20."

Kleinman contended Puget stockholders should get more for their stock than allowed in the agreement, since Puget is in better condition separately than it would be in a merged company.

Dr Thatcher, on the other hand, thought the plan would be financially favorable to Puget stockholders, at the expense of WWP stockholders. He thought that savings of the merged company in operating expenses might be offset by additional expenses when the merged company's financing program is established on a long-term basis. He expressed concern that the merged company might face possible difficulties in refinancing its short term debts and in establishing a long-term financing program, including the selling of common stock.

# Today in Utility Finance

## YIELDS (%)

| | Bonds | | | Preferred Stocks | | | Common Stocks | | |
|---|---|---|---|---|---|---|---|---|---|
| **Quality** | 1st | 2nd | 3rd | 1st | 2nd | 3rd | 1st | 2nd | 3rd |
| DATE | | | | | | | | | |
| 1953 | | | | | | | | | |
| **July 23** | **3.27** | **3.33** | **3.55** | **4.33** | **4.50** | **4.79** | **5.42** | **5.76** | **5.91** |
| July 16 | 3.28 | 3.33 | 3.54 | 4.35 | 4.52 | 4.80 | 5.42 | 5.75 | 5.93 |
| END OF QTR | | | | | | | | | |
| 2nd 1953 | 3.34 | 3.46 | 3.64 | 4.47 | 4.70 | 4.88 | 5.52 | 5.93 | 6.10 |
| 1st 1953 | 3.15 | 3.23 | 3.39 | 4.16 | 4.41 | 4.66 | 4.95 | 5.24 | 5.50 |
| 4th 1952 | 2.99 | 3.03 | 3.14 | 4.06 | 4.22 | 4.59 | 4.98 | 5.33 | 5.62 |
| 3rd 1952 | 2.99 | 3.03 | 3.16 | 4.10 | 4.26 | 4.61 | 5.18 | 5.59 | 5.96 |

Data: Reis & Chandler, Inc.

## EARNINGS

| Company | Period Months Ended | | Net Income 1953 | Net Income 1952 | Earnings Per Common Share 1953 | Earnings Per Common Share 195 |
|---|---|---|---|---|---|---|
| Alabama Power | 12 | June | $12,220,683 | $11,613,661 | $.... | $.... |
| Arkansas Power & Light | 12 | June | 6,580,182(a) | 5,628,298(a) | .... | .... |
| Carolina Power & Light | 12 | June | 7,199,365 | 6,588,724 | .... | .... |
| Central Power & Light | 12 | June | 5,093,399 | 4,429,288 | .... | .... |
| Consumers Power | 12 | June | 22,186,045 | 19,946,709 | 2.77(b) | 2.68(b) |
| Detroit Edison | 12 | June | 19,978,473 | 15,765,703 | 1.89(c) | 1.63(c) |
| Georgia Power | 12 | June | 12,090,562 | 11,081,352 | .... | .... |
| Houston Lighting & Power | 12 | June | 9,766,411 | 7,674,748 | .... | .... |
| Iowa Southern Utilities | 12 | June | 1,343,983 | 832,038 | 1.92(e) | 1.21(e) |
| Kansas City Power & Light | 12 | June | 6,204,286 | 5,055,617 | .... | .... |
| Long Island Lighting | 12 | June | 7,041,224 | 5,864,357 | 1.28(f) | 1.37(f) |
| Louisiana Power & Light | 12 | June | 3,341,574 | 2,729,510 | .... | .... |
| Mississippi Power | 12 | June | 2,230,392 | 1,930,851 | .... | .... |
| Mississippi Power & Light | 12 | June | 3,838,650 | 3,268,277 | .... | .... |
| New York State Electric & Gas | 12 | June | 8,097,303 | 7,269,676 | 2.57 | 2.30 |
| Ohio Edison | 12 | June | 17,848,140 | 14,747,223 | 2.93(g) | 2.74(g) |
| Southern Co. | 12 | June | 21,042,848 | 19,268,479 | 1.16(h) | 1.19(h) |

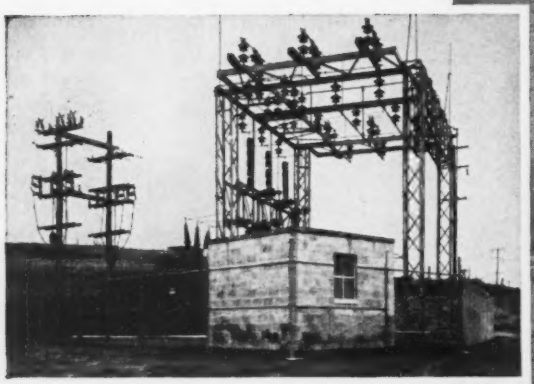
Notes—(a) Allowance has been made for accelerated amortization; (b) Based on 6,794,362 shares in 1953 and 6,176,693 shares in 1952; (c) Based on 10,548,508 shares in 1953 and 9,686,273 shares in 1952; (e) Based on 619,815 shares in 1953 and 558,151 shares in 1952; (f) Based on average number of shares outstanding; (g) Based on 5,278,306 shares in 1953 and 4,798,460 shares in 1952; and (h) Based on 18,087,643 shares in 1953 and 16,172,720 shares in 1952.

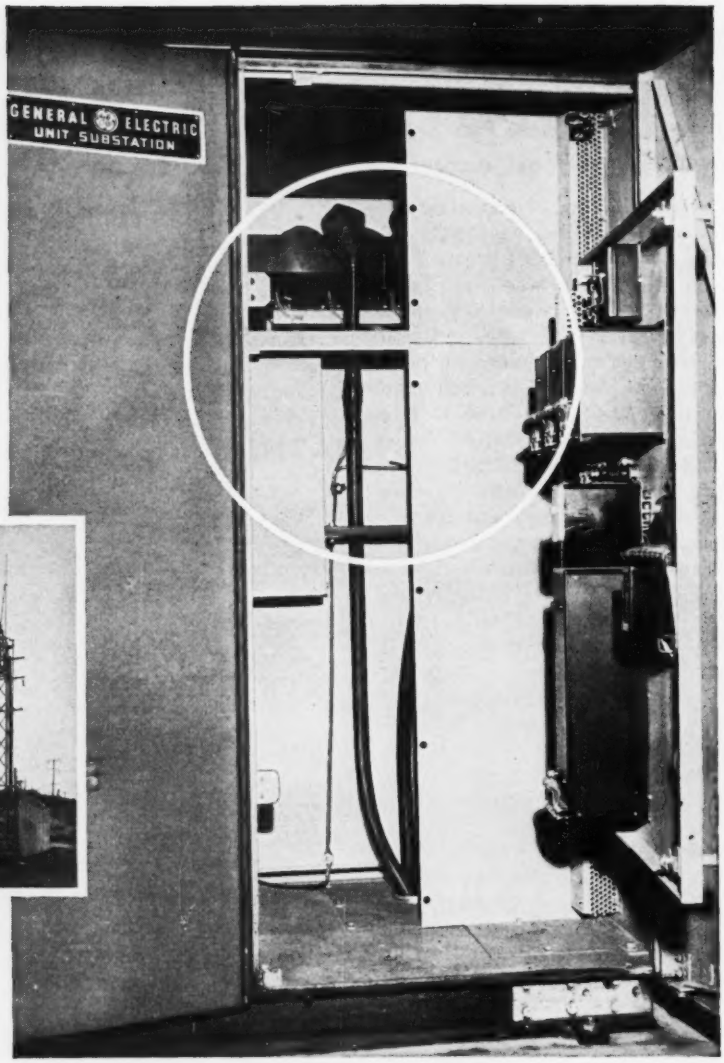
## FINANCING

| Company and Description | Amount of Offering (000) | Offering Price | Yield to Public |
|---|---|---|---|
| SCHEDULE FOR AUGUST—SEPTEMBER—OCTOBER | | | |
| **Bonds** | | | **Bid Date** |
| Southern California Edison—1st mtg due 1978 | $30,000 | ..... | Aug. 25 |
| Wisconsin Power & Light—1st mtg due 1983 | 8,000 | ..... | Aug. 31 |
| Duke Power—1st and refunding mtg due 1983 | 35,000 | ..... | Sept. 1 |
| Louisiana Power & Light—1st mtg due 1983 | 12,000 | ..... | Sept. 15 |
| Duquesne Light—1st mtg | 12,000 | ..... | Sept. 22 |
| Mississippi Power—1st mtg due 1983 | 4,000 | ..... | Oct. 6 |
| Metropolitan Edison—1st mtg due 1983 | 8,000 | ..... | ..... |
| **Debentures** | | | |
| Central Hudson Gas & Electric—conv debs | $6,000 | ..... | ..... |
| **Preferred Stock** | | | |
| Duquesne Light—about 100,000 sh $50 par | $5,000 | ..... | Sept. 17 |
| **Common Stock** | | | |
| Central Hudson Gas & Electric—14 ,000 sh (to be offered commonholders on 1-for-15 basis) | $..... | ..... | ..... |
| Duke Power—28,321 sh (to be offered commonholders on 1-for-20 basis) | ..... | ..... | ..... |
| Duquesne Light—about 150,000 sh | ..... | ..... | ..... |

# YOU DON'T NEED POTHEADS

## . . . when you use G-E Super Coronol cable






Above, substation of eastern electric utility incorporating G-E Super Coronol cable and G-E unit substation. At right, interior view of the G-E unit substation showing how the G-E Super Coronol cables used for "get-aways" are terminated without potheads.

## Take advantage of this way to lower cable installation costs

A growing use of General Electric's Super Coronol* cable is as "get-away" cable in connection with packaged substations. Simplified termination, with no potheads, is one of the reasons.

The new, higher-temperature rating for Super Coronol cable which permits 85 C copper temperature for 0-8000 volts is important, too. This increase in rating has been made after five years of continuous testing under load at temperatures as high as 121 C. For 8001-15000 volts Super Coronol cable is rated at 80 C copper temperature.

Ozone-resisting Super Coronol cable, with its neoprene-base jacket, gives exceptional service wherever high voltage rubber-type cable can be used—for ducts or conduit, aerial service, direct burial, submarine, or generator leads, etc.

Your G-E Wire and Cable specialist can give you more information about Super Coronol cable. Or, write Section W58-827, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

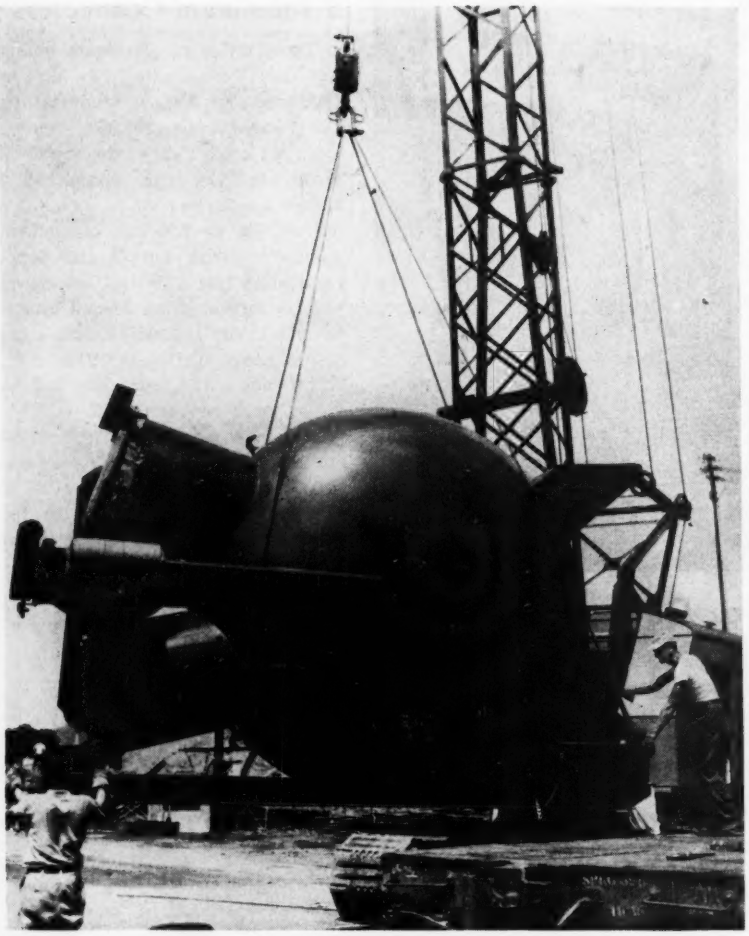
*Registered Trade-mark General Electric Company

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

*You can put your confidence in—*

**GENERAL ELECTRIC**

# MANUFACTURERS & MARKETS



ONE OF THREE pole units of a GE circuit breaker for nation's first 330-kv transmission network is shown being unloaded at Beverly, Ohio. Unit is more than 11 ft in diameter

## GE Ships 330-Kv Unit

### First 15 million-kva circuit breaker is delivered via flatcars to Ohio Power Co's Muskingum River Plant

The first of six 15 million-kva circuit breakers for the nation's first 330-kv power transmission network has been delivered by General Electric Co to Beverly, Ohio, to the Muskingum River Plant of Ohio Power Co, an operating company of the American Gas & Electric Co.

**Shipped on Flatcars . . .** Completely assembled, the 80-ton, 330-kv unit stands more than 25 ft high and has three 3,550-gal oil tanks measuring more than 11 ft in diameter. The circuit breaker was shipped from GE's switchgear plant at Philadelphia on two railroad flatcars and one boxcar. Seven breakers will be installed at the Muskingum River Plant, the first of which are scheduled for installation this autumn. GE is supplying the network with six 15 million-kva units and ten 25 million-kva units.

The steel-clad impulse breakers for the 330-kv network are derived from the porcelain-clad breakers equipped with impulse-type interrupters, first applied on the 287-kv lines between Hoover Dam and Los Angeles in 1934. The new 330-kv breaker uses the impulse oil-blast interruption principle. Interruption time is three cycles over the full range of current up to rating.

The lens-shaped tank structure, which houses a pair of interrupters, is formed from two flanged domes which are seam welded. By the use of this tank shape, electrical clearances between live parts and the tank are maintained with safe margins, holding tank volume to a minimum. Thus the oil volume is kept to 3,550 gallons per pole.

**Ten-Ton Pressure . . .** Of center-clamped design, bushings for the new breakers are designed to withstand an impulse voltage surge of 1,175 kv and a 60-cps voltage of 555 kv.

Each pole unit of the three-pole breaker is mounted with a pneumatically trip-free mechanism. With heavy loading of compression springs on the impulse interrupter piston, the three-mechanism design eliminates long inter-phase connecting rods and reduces inertia of moving parts that would be needed with the 14½ ft-phase spacing of the 330-kv breaker.

## Selling Methods Viewed At Manufacturers Forum

Executives of 17 electrical manufacturers participated in a two-day forum on selling practices and agency operation held by the Electrical Equipment Representatives Association at Glenwood Springs, Colo., last month.

Forum members, led by Richard A. Kent, Richard A. Kent Co, New York, assumed that manufacturers will use agents instead of direct salesmen only if the former are economically justifiable. Discussion centered on type and number of salesmen needed for proper territorial coverage, specialization vs generalization on account selling, amount of non-selling service expected by a manufacturer, and improvement of regular office routine.

EERA President Earl S. Condon, Earl S. Condon Co, Los Angeles, announced receipt of several applications for membership in the organization. Particularly heartening, he said, was the number of applications for associate membership, open to those agents who have not been in business for five years.

## Multi-Purpose Arrester Developed

Development of a new multi-purpose, Type MP, lightning arrester by Ohio Brass Co has required extensive basic research, involving exacting manufacturing and test equipment. Paul M. Ross, assistant manager, power utilities department; J. J. Taylor, chief engineer, Barberton plant; J. W. Kalb, development engineer; W. H. Burleson, manager, power utilities department; and J. T. Lusignan, executive engineer, are here inspecting the series gap in the Thorex arrester to be announced soon. In the background is one of the testing devices developed as part of the arrester manufacturing equipment.

## Fargo Manufacturing Adds 3 Aluminum Connectors

Three styles of aluminum connectors are being added to the line produced by Fargo Manufacturing Co, Poughkeepsie, N. Y. They are:

1. A heavy duty two-bolt all-aluminum vise-type connector to handle conductors up to 397,500 cir mil ACSR or 500,000 cir mil all-aluminum, with tap-off for copper conductors No. 4 to 400,000 cir mil.

2. A larger spring loaded type of hot-line clamp that will handle a conductor range up to 397,500 cir mil ACSR plus armor rods. This has provision for a copper tap-off wire.

3. A new tap-off stirrup type hot-line connector for use with conductor sizes up to 397,500 cir mil ACSR will be produced in three to four weeks, Fargo's third and largest size.

## MANUFACTURING BRIEFS

**Reynolds Metals Co** has advanced its primary aluminum prices ½ to 1 cent a pound, retroactive to July 20. Prices of its other aluminum products will be increased proportionately.

**Worthington Corp** has announced plans to spend over a million dollars to expand and modernize its Plainfield, N. J., works. During the next nine months the company expects to increase by one-third its production of construction equipment, positioning machines, and industrial mixers.

## MANUFACTURERS' EARNINGS

| Company | Period Months | Ended | Net Income 1953 | Net Income 1952 | Earnings Per Common Share 1953 | Earnings Per Common Share 1952 |
|---|---|---|---|---|---|---|
| Allis-Chalmers Manufacturing | 3 | June | $5,648,875 | $6,291,733 | $1.81 | $2.20 |
| Allis-Chalmers Manufacturing | 6 | June | 10,453,368 | 11,510,307 | 3.33 | 4.05 |
| Babcock & Wilcox | 6 | June | 5,203,163 | 3,338,923 | 3.51 | 2.37 |
| Buffalo Forge | 3 | May | 416,871 | 426,277 | 1.28 | 1.31 |
| Colorado Fuel & Iron | 3 | June | 2,840,223 | ... | | |
| Colorado Fuel & Iron | 12 | June | 7,621,741 | 5,761,965 | 3.07 | 2.64 |
| Copperweld Steel | 6 | June | 1,837,625 | 842,925 | 3.33 | 1.59 |
| Corning Glass Works | 6 | June | 6,797,401 | 4,619,531 | 2.50 | 1.68 |
| Dow Chemical | 12 | May | 35,857,000 | 35,818,010 | 1.58 | 1.65 |
| Elliott | 6 | June | 1,343,943 | 1,577,561 | 2.23(a) | 3.10(a) |
| General Cable | 6 | June | 2,971,347 | 2,469,954 | 1.36 | 1.10 |
| Johns-Manville | 3 | June | 6,413,358 | 6,408,810 | 2.02 | 2.03 |
| Johns-Manville | 6 | June | 9,100,000 | 11,917,187 | 3.58 | 3.77 |
| Libbey-Owens-Ford Glass | 6 | June | 8,594,594 | 7,458,068 | 1.66 | 1.45 |
| Minn.-Honeywell Regulator | 3 | June | 2,568,881 | 1,731,272 | .86 | .56 |
| Minn.-Honeywell Regulator | 6 | June | 4,901,651 | 3,025,855 | 1.63 | .96 |
| Sylvania Electric Products | 3 | June | 2,395,849 | 1,445,005 | .86 | .60 |
| Sylvania Electric Products | 6 | June | 5,169,092 | 3,398,776 | 1.87 | 1.48 |
| Union Carbide & Carbon | 3 | June | 26,783,480 | 23,059,977 | .93 | .80 |
| Union Carbide & Carbon | 6 | June | 52,478,580 | 46,440,458 | 1.82 | 1.61 |

Notes—(a) On shares outstanding at close of respective periods.

## MEETINGS CALENDAR

**International Association of Electrical Leagues**
18th Annual Conference, Fairmount Hotel, San Francisco, Aug. 5-8.

**Western Electronic Show-Convention**
Co-sponsored by Institute of Radio Engineers and West Coast Electronic Manufacturers Association; San Francisco Civic Auditorium; San Francisco, Week of Aug. 17.

**American Institute of Electrical Engineers**
Pacific General Meeting, Hotel Vancouver, Vancouver, B. C., Sept. 1-4; Middle-Eastern District Meeting, Daniel Boone Hotel, Charleston, W. Va., Sept. 29-Oct. 1; Fall General Meeting, Muehlebach Hotel, Kansas City, Mo., Nov. 2-6.

**Northwest Public Power Association**
Accounting Section, Monticello Hotel, Longview, Wash., Sept. 17-18.

**Rocky Mountain Electrical League**
50th Annual Fall Convention, Broadmoor Hotel, Colorado Springs, Colo., Sept. 20-23.

**Edison Electric Institute**
Accident Prevention Committee, Radisson Hotel, Minneapolis, Sept. 21-22; Transmission-Distribution Committee, Hotel Nicollet, Minneapolis, Oct. 8-9; Industrial Relations Committee, Fall Round-Table Conference, Sheraton Hotel, Chicago, Oct. 12-14; Electrical Equipment Committee, Jung Hotel, New Orleans, La., Nov. 2-3.

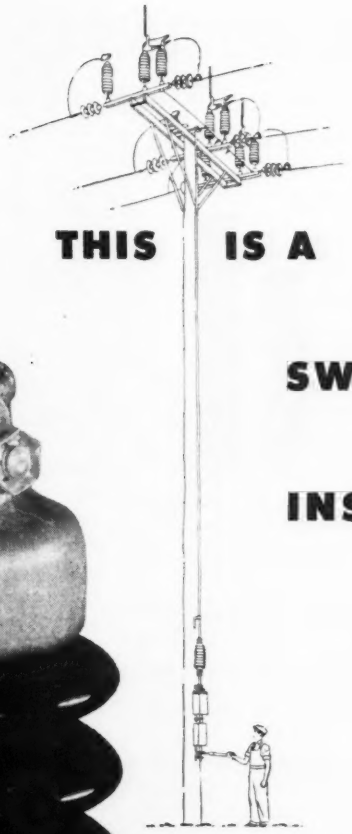
*Great Lakes Power Club
Plankinton House, Milwaukee, Wis. Oct. 1-2.

**Southeastern Electric Exchange**
Fall Meeting, Engineering-Operation Section, Carolina Hotel, Pinehurst, N. C., Oct. 1-2; Accounting Conference, Battery Park Hotel, Asheville, N. C., Oct. 15-16; General Sales Conference, Atlanta Biltmore Hotel, Atlanta, Ga., Nov. 19-21.

**American Society of Mechanical Engineers**
Fall Meeting, Sheraton Hotel, Rochester, N. Y., Oct. 5-7; Annual Meeting, Statler Hotel, New York, Nov. 29-Dec. 4.

**National Electrical Manufacturers Association**
Annual Meeting, Haddon Hall, Atlantic City, N. J., Nov. 9-12.

*Addition this week.

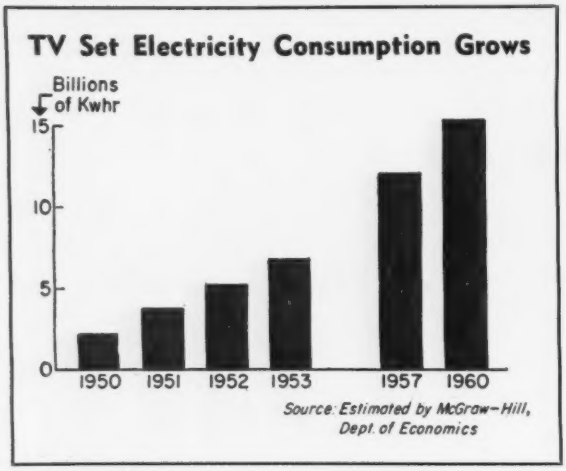


# THIS IS A SWITCH-ROD INSULATOR

**This** "special" Lapp insulator is a regular catalog item, and may be found on page 79 of the current Lapp Catalog No. Seven. It is regularly supplied, in considerable quantities, directly to power companies and through switch manufacturers. This particular combination, porcelain and attached caps, is a design now 27 years old, and it has performed with distinction, mechanically and electrically. For certain of your operating problems it may be a complete solution.

Beyond that, however, this particular insulator is of interest in the genealogy of electrical porcelain. Designed and first produced in 1926, it is the first unit of the now widely-used Lapp Post design. With characteristic fog-type leakage corrugations, it is a closed-end porcelain with integral top diaphragm, and sanded surfaces for outside bonding of metal caps. The Lapp Line Post and Station Post designs which followed a few years later were logical steps in the whole series of Lapp-pioneered improvements in operating characteristics of transmission and station insulators—and the resulting improved reliability of systems on which they are used. Lapp Insulator Co., Inc., Le Roy, N. Y.

**Lapp**




## TV Is Boosting Power Sales

### New stations are opening up new areas and driving up set sales. Color may soon be factor

Television is a fast-growing contributor to residential power consumption. Receivers will use close to 7 million kwhr of electricity this year—more than three times the amount used in 1950. And TV power consumption will continue to expand rapidly in the near future (chart).

Two main factors are behind the prospect of rapid future growth in the amount of electricity used by TV sets. One is continued spread of television across the country through the addition of stations. There are now more than 190 stations operating, compared to 123 at the end of 1952. The number will pass 225 before the end of this year and will probably go well over 400 during 1954. Opinions on the eventual number of stations vary widely, but it's likely that 800 or more stations will be telecasting regularly by the end of 1960.

**TV Available Most Everywhere by 1960 . . .** The number of television viewers will not, of course, increase proportionally with the station increase. Many of the new transmitters are going to areas that already have TV; so they will not add to the audience. Others will go in areas where the potential TV audience is relatively small. But—by 1960—there will be very few wired homes in the U. S. that are not reached by at least one television station.

Color television is the second factor promising to push up electricity use. The first color sets, because they contain more tubes, will use about twice as much energy as black and white sets. An early color set, if viewed as often as the average black and white set, may require about 580 kwhr of electricity per year.

Color may very well increase television's electricity consumption in another way. Chances are color will prove far more attractive to the viewer than black and white. The result could be increased set use.

Color television, however, will be slow to exert much influence on residential electricity use. Regular sales of color receivers will probably not begin until early 1954. And the first sets will be so expensive (estimates range up to $1,000) that the market will be very small.

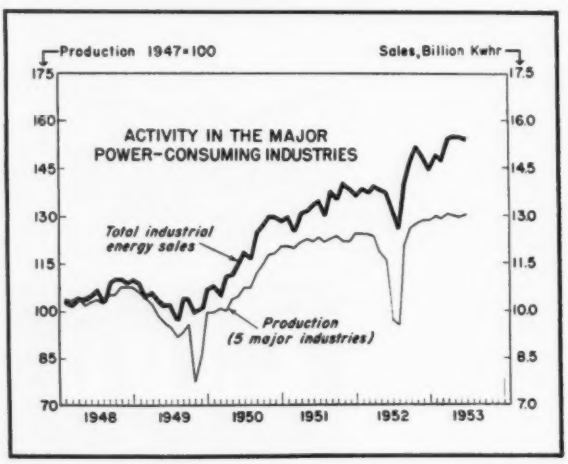
Color sets may still be a minor fraction of the total sets sold in, say, 1957 (probably less than 10%), but half the sets sold in 1960 may be color receivers. By then several million color sets will probably be in regular use.

**Some TV Factors May Decrease Energy Use . . .** Not all the influences operating in television tend to increase power consumption. For instance, some studies have indicated that people spend less time watching their sets after they have had them for a few years. This tendency, if it exists, will partly counteract the effect of increased attractiveness of color television.

Furthermore, transistors may eventually replace some vacuum tubes in receivers. And transistors use so little power, compared to tubes, that the effect on consumption would be substantial. At the moment, however, use of transistors is barred by high cost and technical limitations.

Adding up these trends and possibilities: Power consumption by television sets is likely to reach 15 billion kwhr or more by 1960, compared to about 6.8 billion kwhr this year. This assumes that there will be about 50 million sets in homes by 1960, about 5.5 million of them color sets.

If the shift to color television continues, then rapid growth in power use by television sets will be maintained well past 1960, even though nearly everyone will have some kind of a set by that year. And total power use by the television industry—telecasting and transmission as well as receiving—is substantially higher than the figures on the chart. By 1960, telecasting and transmission will require several billion additional kwhr per year.

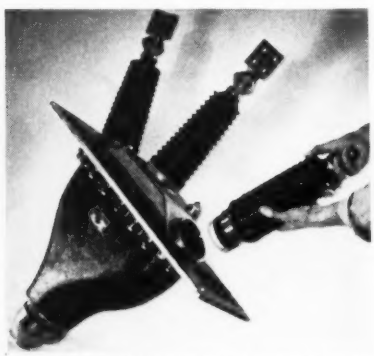


**Lugs, insulators, bell shapes, and cable entrances** are all interchangeable. This is an important feature of AnacondA Potheads.

# ANACONDA POTHEADS

**This complete line is engineered by power-cable specialists for use with *any* make of cable. Parts are *fully* interchangeable for greater adaptability, faster delivery, easier installation and lower cost.**

Not hundreds—but thousands of different ANACONDA Potheads can be made up from relatively few interchangeable parts. There's a type for every use—capnut, transformer, switchgear, disconnect, and through types.



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NAME.....

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ADDRESS.....

CITY.....STATE.....

# Be Warned!

**Thermalite Indicator Automatically Checks Distribution Transformer Loading**

**You get plenty of warning** when overloads caused by load growth are nearing the limits of voltage regulation and transformer capability, thanks to the *Thermalite* overload indicator. A signal light on the transformer, clearly visible from the street, singles out overloaded units without the expense of a complete load survey. You get ample time to make a change in your distribution system without sacrificing service continuity.

On most distribution systems, the peak load is limited by the allowable secondary voltage drop. The *Thermalite* indicator lights up when you've made full use of transformer overload capacity within voltage regulation limits. It does not respond to momentary abnormal overloads.

**Operation is simple.** A thermal element located in the top oil, away from all live parts, actuates the signal lamp circuit. The brilliant signal lamp remains lit until reset by means of a convenient external handle.

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A-4085

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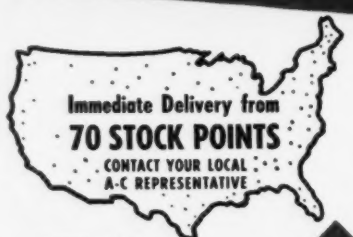


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# ALLIS-CHALMERS

AUGUST 10, 1953

# Electrical World

Price 35 Cents

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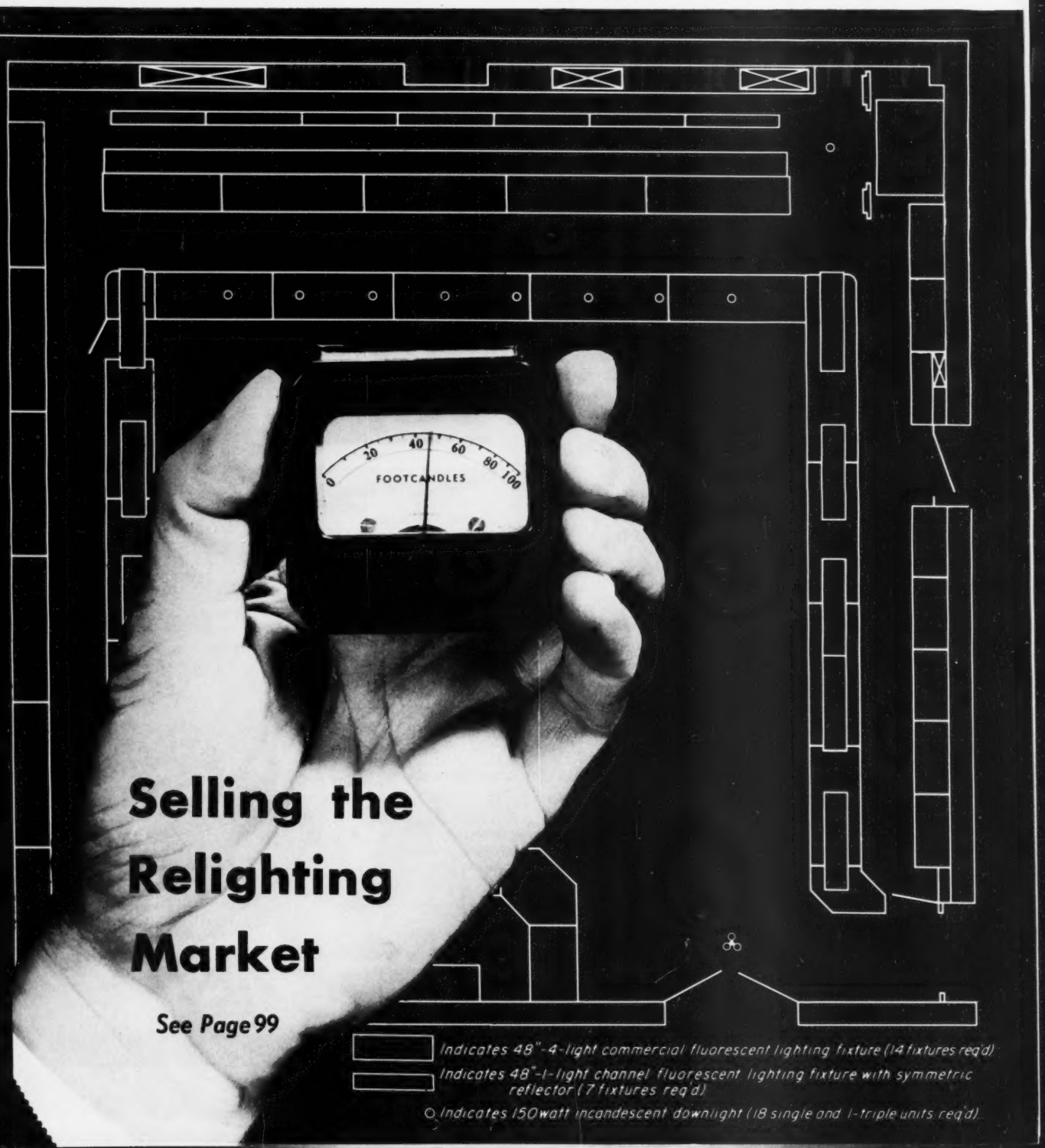
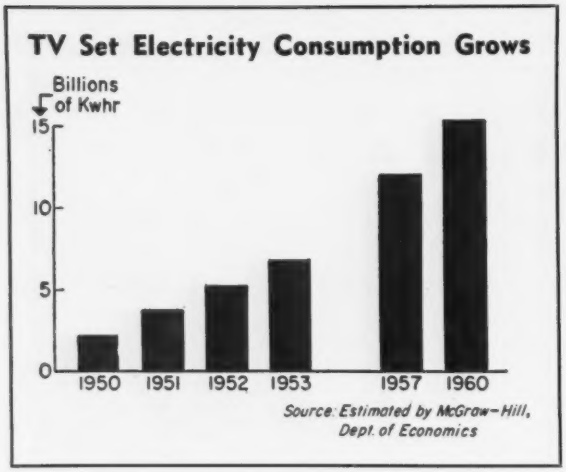



## Selling the Relighting Market

See Page 99

# ELECTRICAL BUSINESS OUTLOOK

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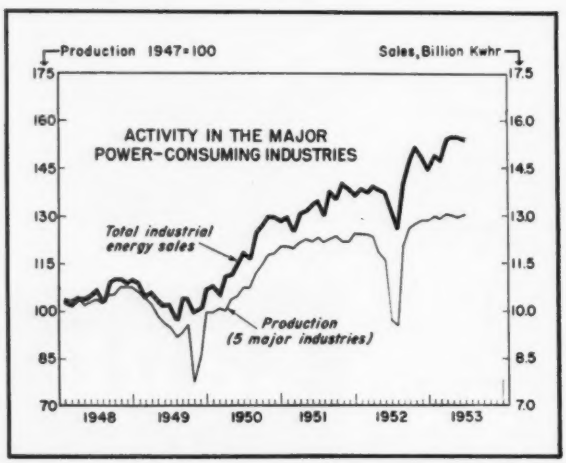

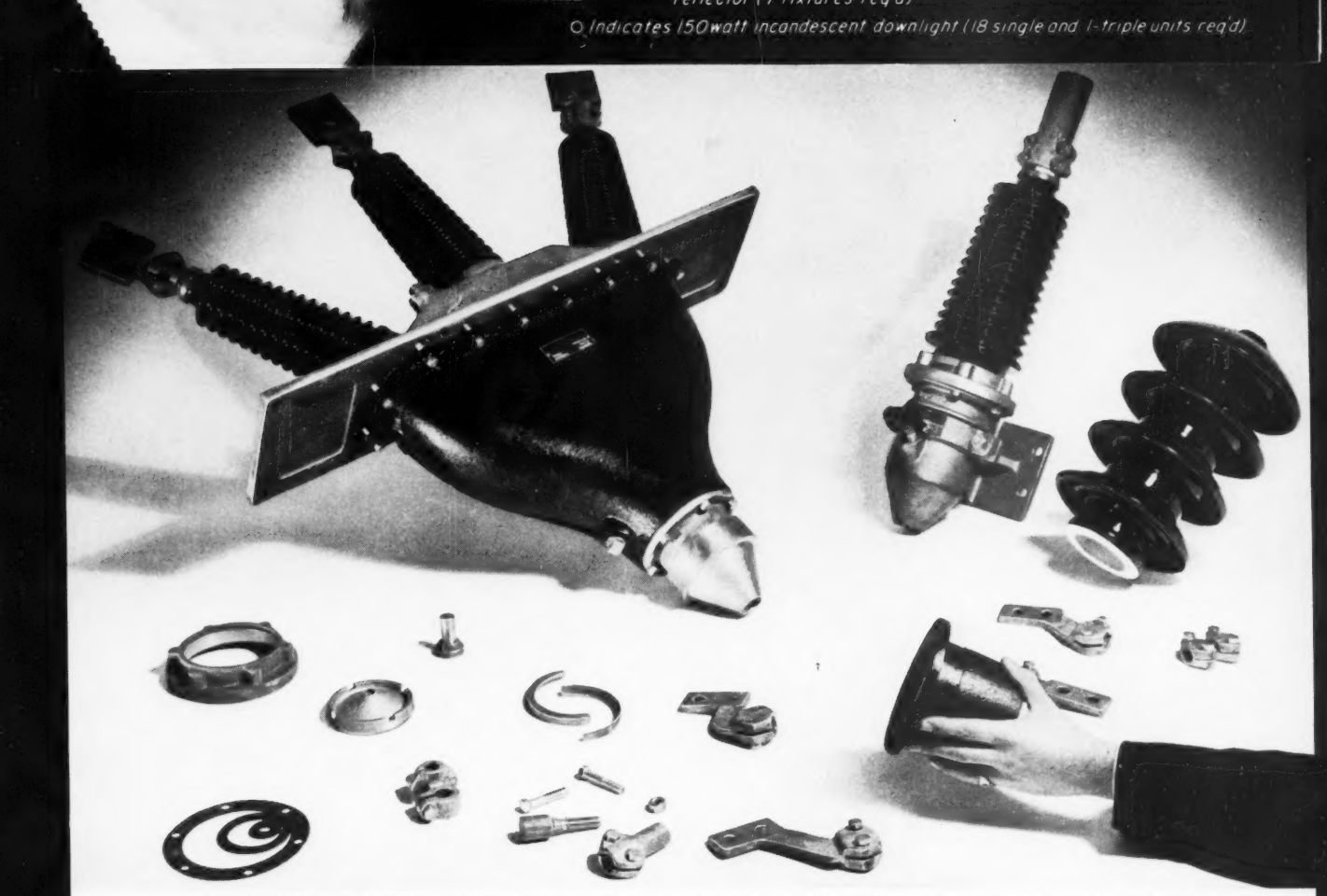


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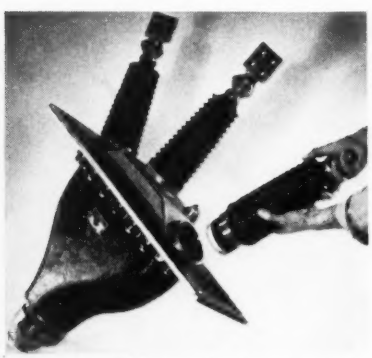

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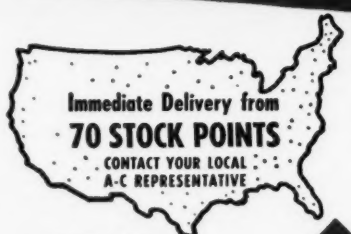


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